Appendix C: Traffic Technical Report

EXIT 4A – Traffic and Transportation Technical Report

I-93 Exit 4A Supplemental Draft Environmental Impact Statement

Prepared for:

Town of Derry
Town of Londonderry
New Hampshire Department of Transportation

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1.0 Introduction

The Interstate 93 (I-93) Exit 4A Project (the "Project") involves a new diamond interchange between Interstate 93 Exits 4 and 5 in the Town of Londonderry, approximately one mile north of Exit 4. The new diamond interchange would provide access to the east side of I-93 only. A 1-mile connector roadway would be built on new alignment from the interchange to Folsom Road, near the intersection of North High Street and Madden Road, in the Town of Derry. Folsom Road, and subsequently Tsienneto Road, would be upgraded, and the intersections would be improved.

The Project was the subject of a Draft Environmental Impact Statement (DEIS) in 2007 (FHWA, 2007). Due to the amount of time that has elapsed since the 2007 DEIS, the FHWA has requested the preparation of updated studies that will be documented in a Supplemental Draft Environmental Impact Statement (SDEIS) in accordance with the National Environmental Policy Act (NEPA). The SDEIS will provide an up-to-date assessment of the environmental effects of the Project and the evaluation of reasonable alternatives that will consider updated information including, but not limited to, traffic, socioeconomic projections, land development proposals in the project area, and changes in environmental resources and regulatory requirements.

The purpose of this report is to document the development of traffic projections and operational analyses for the Project as part of the SDEIS. This report is a compilation of previous memoranda issued as the project proceeded as well as to present the findings of the analyses of the various alternatives.

The traffic analysis tasks described in this report includes the following:

- Collection of traffic count data at various roadways and intersections in the Exit 4A study area to develop 2015 Average Weekday Traffic (AWDT) volumes.
- Use of these 2015 counts to calibrate the Southern New Hampshire Planning Commission (SNHPC)'s regional traffic model to be viable to project future traffic volumes in the 2040 design year with and without the proposed Exit 4A.
- Preparation of land use and socioeconomic projections (conducted concurrently by the Land Use Working Group) for the SNHPC model area and allocated to the Traffic Analysis Zone (TAZ) level for each alternative scenario to be used as the basis for traffic generation and trip assignments to the regional roadway network.
- Development of 2040 No-Build (without Exit 4A) and Build (with Exit 4A) traffic volume assignments on key roadway segments and intersections in the study area network.
- Derivation of AM and PM peak hour traffic volumes on the mainline I-93 and interchange ramps as well as key segments and intersections in the study area for the various Exit 4A alternative layouts for analysis purposes (see Figure 1).
- Analysis of interstate operations using the *2010 Highway Capacity Manual* (TRB, 2010) Freeway Facilities methodologies for the existing 2015 and all 2040 No-Build and Build scenarios. Analysis of signalized and unsignalized intersection operations of the existing 2015 and all 2040 scenarios using HCM methodologies and emulated in the *SYNCHRO/Sim-Traffic (Trafficware, 2016)*software for

derivation of Level of Service and estimated queue lengths for conceptual design purposes.

In addition to the traffic data collection, Project Team specialists and the Land Use Working Group conducted interviews and compiled socioeconomic (e.g., population and employment) projections that were used by the SNHPC to allocate these trip-generation characteristics to their traffic zone system to generate traffic assignments to the roadway network under both No-Build (without 4A) and the Build alternatives that were included in the DEIS from 2007. A separate Land Use Scenario Technical Report was prepared that documents the land use and socioeconomic forecasting efforts that were used in conjunction with the traffic modeling. (Louis Berger, 2017).

2.0 Purpose and Need for the Project

The Purpose and Need for the Project, as described in the 2007 DEIS, is as follows:

- Providing for transportation improvements that will promote the safe and efficient movement of people, goods, and services between I-93 and the towns served by NH Route 102, specifically Derry and Londonderry, that are immediately adjacent to I-93 Exit 4;
- Providing an alternative route to the Interstate system for traffic using NH Route 102 to and from the east, thus removing a large volume of through traffic from the heavily congested downtown Derry street network;
- Providing improved Interstate access for commercially and industrially zoned lands near NH Routes 28 and 102 in both Derry and Londonderry, thus allowing for the planned and orderly development of such lands to further locally-defined economic development goals and tax base diversification; and
- Enhancing and promoting the economic vitality of the downtown Derry area, presently characterized by traffic congestion and decreasing vehicular and pedestrian safety, by separating local destination-oriented traffic from through-traffic destined for the Interstate system.

For purposes of this project, the downtown Derry area has been defined as NH Route 102 easterly from its intersection with Fordway to the NH 28 (Crystal Avenue/Birch Street) intersection (CLD|Fuss & O'Neill, 2018). This is also consistent with the defined Central Business District zoning map for the Town of Derry (Town of Derry, 2015).

3.0 Traffic Data Collection

The study area for the Project was established and agreed upon as part of the 2007 DEIS document, and encompasses the expected extent of the roadway network that would likely be influenced by the introduction of a new I-93 interchange and associated connector roadways. An updated inventory of the key area roadways and intersections was conducted to ensure that the traffic modeling and subsequent analyses reflect existing conditions.

The various contracts for the I-93 widening project affecting the study area also needed to be considered. The Exit 5 improvements are already in place, and the Exit 4 interchange is being reconstructed now as part of Contract 14633-D. The widening of the mainline I-93 to four lanes between Exits 4 and 5 under Contracts 'D' and 'I' is also underway.

3.1 Traffic Counts

The traffic counting program was developed for the project, based on the key roadway segments and intersections in the study area, to assist in the development of 2015 base Average Annual Weekday Traffic (AAWDT) volumes for use in the traffic model calibration. Most of these locations were counted in 2005 as part of the preparation of the original 2007 DEIS document. This effort was coordinated with the annual traffic counting programs conducted by both the NHDOT and SNHPC within the study area, and the new data collected in May and June of 2016 while school was still in session. Some of these locations had already been counted in 2014 or 2015 (NHDOT, 2016a, 2016b, 2016c), so all data was evaluated and subsequently adjusted to reflect 2015 AAWDT conditions.

The Automatic Traffic Recorder (ATR) counts were taken for a 3-5 day period. A listing of the locations is included below and shown in Figure 2.

Interstate Locations (15)

I-93 NB and SB, south of Exit 4 (NHDOT permanent recorder)
I-93 Exit 4 – NB and SB on- and off-ramps (5)
I-93 Exit 5 – NB and SB on- and off-ramps (4)
I-93 NB and SB between Exits 4 and 5 (2)
I-93 NB and SB north of Exit 5 (2)

State Highways/Local Streets (22)

Crystal Avenue (NH Route 28), south of Tsienneto Road
Folsom Road, west of NH Route 28
Pinkerton Street, east of Tsienneto Road
Tsienneto Road, east of Pinkerton Street
Chester Road (NH Route 102), east of NH Route 28 Bypass (Sylvestri Circle)
North Main Street (NH Route 28 Bypass), north of Pinkerton Street (Academy Drive)
North Main Street (NH Route 28 Bypass), north of Tsienneto Road
South Main Street (NH Route 28 Bypass), south of Thornton Street
Tsienneto Road, west of NH Route 102
NH Route 102, at Derry Town line
NH Route 28, at Derry/Londonderry Town line
Gilcreast Road, north of NH Route 102
NH Route 102, west of Abbot Street
NH Route 102, east of Griffin Street
Fordway, over Beaver Brook

Franklin Street, north of Folsom Road
Ash Street at Londonderry Town line
Ash Street, east of Londonderry Road
NH Route 28, east of Perkins Road
NH Route 28, south of Rollins Street
NH Route 28, north of Liberty Drive
NH Route 102, east of Hampton Drive

Intersection Turning Movement Counts (TMCs) – AM and PM Peak Periods (19)

The intersection counts were taken in groups of intersections within five general groups or 'zones' in close proximity to each other to facilitate ease of data collection and to minimize significant differences between locations, even if there were intervening roadways or driveways that would not allow balancing between sites. These groups of intersections were numbered as follows and shown in Figure 3:

Zone 1		Zone 2	
#3	Exit 5 SB ramps	#1	Exit 4 SB ramps
#4	Exit 5 NB ramps	#2	Exit 4 NB ramps

Zone 3	
#5	NH Route 102/Londonderry Road/St. Charles Street
#6	NH Route 102 (Broadway)/Fordway/Madden Hill Road
#7	NH Routes 102/28 (Crystal Avenue/Broadway/Birch Street)
#8	North High Street/Ash Street Extension
#9	North High Street/Madden Road
#10	North High Street/Folsom Road/Franklin Street/Franklin Street Extension

Zone 4	
#11	NH Route 28/Folsom Road/Tsienneto Road (Ross' Corner)
#12	Tsienneto Road/Pinkerton Street
#13	NH Route 28/Linlew Drive
#14	NH Route 28/Ashleigh Drive
#15	NH Route 28/Scobie Pond Road

Zone 5	
#16	NH Routes 102/28 Bypass/East Derry Road (traffic circle)
#17	NH Route 28 Bypass/Pinkerton Street/Nesmith Street
#18	NH Route 28 Bypass/Tsienneto Road
#19	NH Route 102/Tsienneto Road

Copies of the relevant raw traffic count data are included in Appendix A.

Other new intersections that would be created by some of the Exit 4A alternatives will also need to be evaluated and analyzed. In addition, it was determined as the study progressed that additional intersections at the east end of the study area should be

collected, since they will be influenced by any improvements at the NH Route 102/Tsienneto Road intersection. These intersections were at NH Route 102/North Shore Road (#26) and at NH Route 102/English Range Road (#27). This data is also included in Appendix A.

Adjustment Factors used for Data Reduction

Because of the nature of the regional roadway network, there are several different adjustment factors that need to be applied to the raw counts to derive AWDT. In general, there are seasonal factors, annual growth factors, and axle correction factors, based on the type of roadway being considered. NHDOT develops these factors for various roadway types based on their evaluation of permanent traffic recorder stations across the state. NHDOT differentiates between Rural and Urban Interstates (called Groups 1 and 3, respectively), as well as Rural and Urban Highways (Groups 2 and 4, respectively), for which there is a wealth of short-term and long-term factors that are developed annually by NHDOT as part of their normal practice (NHDOT, 2016d). Appendix B includes the tables showing the various seasonal, annual and axle correction factors applied to the raw traffic counts in this report.

Seasonal Factors

In this study area, there are Interstate roadways (I-93) as well as state highways and local streets in an urbanized area, so the Group 3 and 4 seasonal factors in Appendix B were applied here. Since counts were taken on specific dates in May, the 2015 seasonal adjustment factors were applied to each count separately based on the date of the count and the type of roadway.

Annual Growth Factors

Annual growth factors are also applied because of the different years that the counts were taken. There is an NHDOT permanent traffic recorder in the immediate study area on I-93 just south of Exit 4 at the Derry/Windham town line, but it may not be indicative of growth on the local street network because the interstate is more prone to fluctuations in regional traffic. A comparison of May 2015 to May 2016 traffic counts on I-93 indicates a 1.1% growth rate on the Interstate system. It should be noted that this counter is located north of the current construction area, so it should not have been influenced by drivers trying to avoid construction-related delays. This 1.1% annual growth rate was applied to the 2016 mainline I-93 traffic data only to adjust the data downward to the 2015 base year AWDT.

Another permanent recorder is located on NH Route 28 in Windham south of the study area that should be more representative of the urbanized roadways within the Derry/Londonderry area. A comparison of May 2015 to May 2016 traffic counts at the NH Route 28 location indicates a 2.5% growth rate, which was then applied to the rest of the study area roadway system to derive the 2015 AWDT.

There are also ramp volume counts at Exits 4 and 5 that need to be seasonally adjusted**. In discussions with the NHDOT Bureau of Traffic (NHDOT, 2016e), it was agreed that these ramp volumes would exhibit characteristics more in line with the local street network as opposed to seasonal variations in Interstate traffic.** As such, the 2.5% growth rate was also applied to the ramp volumes to derive the 2015 AWDT.

Axle Correction Factors

Axle correction factors are also applied to adjust for differences in vehicle classification on various types of roadways to derive a total number of actual vehicles. It is essentially a correction for the assumed number of two-axle vehicles gathered by the field-counting apparatus (such as road tubes) to account for multi-axle vehicles in the traffic stream, based on the FHWA 13-tiered classification system. These factors are developed by NHDOT based on vehicle classification information collected on the various functional classifications of roadways in the state.

Each of the major roadways in the study area has already been functionally classified based on its overall role in the regional roadway network. Since this is an urbanized area, the classifications that are applied here are urban interstate (FC 11), urban principle arterials (FC 14), urban minor arterials (FC 16), collector roadways (FC 17), and local streets (FC 19). The 2015 axle correction factors table is also provided in Appendix B.

Development of 2015 AAWDT Base Volumes

Table 1 shows a summary of the adjusted 2015 AAWDT volumes derived from applying the various adjustment factors to the 2015 and 2016 raw traffic counts. In some cases, such as for the 2014 counts, the NHDOT has already developed the AAWDT for locations of interest in the study area, which only need to be annually adjusted upward to 2015. This adjustment factor has also been applied to the AM and PM peak hour volumes and 'k' factors (the percentage of AAWDT during each peak hour for each movement) calculated for comparison to the intersection TMCs for future analysis purposes.

TABLE 1

ATR Count Summary - Adjusted 2015 AAWDT and Peak Hour Volumes

Annual Growth rates:

2014->2015	**1.025**
2015->2015	**1.000**
2016->2015	**0.975**

Seasonal: Use Urban Highway Group 4 adjustment factors

Intersection Turning Movement Counts

		AM Peak	PM Peak
April	Adj Factor=	**0.96**	**0.99**
May		**0.96**	**0.98**
June		**0.96**	**0.94**
July		**1.04**	**0.96**
Sept		**0.95**	**0.97**

	Count Location	Count Month/Yr	Raw AAWDT	Adj 2015 AAWDT	700-800am Counted AM Peak Volume	Adj 2015 AM Peak Volume	AM Pk as % of AAWDT	400-500pm Counted PM Peak Volume	Adj 2015 PM Peak Volume	PM Pk as % of AAWDT
Derry	Crystal Ave (NH Route 28), S of Tsienneto	May-16	15585	15195	836	803	5.28%	1418	1390	9.15%
	Folsom Rd W of NH Route 28	May-16	12070	11768	778	747	6.35%	1199	1175	9.98%
	Pinkerton St E of Tsienneto	May-16	10722	10454	695	667	6.38%	1017	997	9.54%
	Tsienneto Rd, W of NH Route 102	May-16	5532	5394	483	464	8.60%	511	501	9.29%
	Tsienneto Rd E of Pinkerton	May-16	15012	14637	1113	1068	7.30%	1499	1469	10.04%
	NH Route 102, E of NH Route 28 Bypass	May-16	7456	7270	595	571	7.85%	661	648	8.91%
	NH Route 28 Byp, N of Academy Dr	May-16	8615	8400	756	726	8.64%	881	863	10.27%
	NH Route 28 Byp, N of Tsienneto Rd	May-16	12250	11944	997	957	8.01%	1201	1177	9.85%
	NH Route 28 Byp, S of Thornton Rd	May-16	14341	13982	1110	1066	7.62%	1392	1364	9.76%
	NH Route 102 E of Griffin St	Apr-14	16000	16400	1054	1012	6.17%	1224	1212	7.39%
	NH Route 102 W of Abbot St	Apr-14	14000	14350	1020	979	6.82%	1148	1137	7.92%
	Fordway over Beaver Brook	Apr-14	5200	5330	410	394	7.39%	481	476	8.93%
	Franklin St Ext, N. of Folsom Rd	Apr-14	1800	1845	99	95	5.15%	171	169	9.16%
	Ash St at Londonderry town line	Apr-14	6600	6765	410	394	5.82%	722	715	10.57%
	Crystal Av (NH Route 28), S of Rollins	Jun-15	13000	13000	819	786	6.05%	1174	1104	8.49%
	average						6.90%			9.28%
L-derry	NH Route 102, E of Hampton Dr	Jul-15	32000	32000	2478	2577	8.05%	2842	2728	8.53%
	NH Route 102 at Derry Town line	May-16	22656	22090	1718	1649	7.46%	1796	1760	7.97%
	NH Route 28 at Derry Town line	May-16	17324	16891	1279	1228	7.27%	1682	1648	9.76%
	NH Route 28 N of Liberty Dr	Sep-15	13000	13000	1176	1117	8.59%	1054	1022	7.86%
	Gilcreast Rd N of NH Route 102	May-16	10070	9818	697	669	6.81%	1008	988	10.06%
	Ash St E of Londonderry Rd	Jun-15	6900	6900	427	410	5.94%	723	680	9.86%
	average						7.36%			9.00%
					700-800am			400-500pm		
	Exit 4 NB Off-ramp	May-16	10249	9993	435	418	4.18%	1223	1199	12.00%
	Exit 4 NB On-ramp	May-16	10303	10045	1079	1036	10.31%	812	796	7.92%
	Exit 4 SB Off-ramp	May-16	9862	9615	753	723	7.52%	952	933	9.70%
	Exit 4 SB On-ramp - EB to SB	May-16	5310	5177	673	646	12.48%	311	305	5.89%
	Exit 4 SB On-ramp - WB to SB	May-16	4767	4648	537	516	11.10%	244	239	5.14%
	average						9.12%			8.13%
	Exit 5 NB Off-ramp	May-16	5745	5601	400	384	6.86%	472	463	8.27%
	Exit 5 NB On-ramp	May-16	9580	9341	992	952	10.19%	793	777	8.32%
	Exit 5 SB Off-ramp	May-16	9520	9282	781	750	8.08%	939	920	9.91%
	Exit 5 SB On-ramp	May-16	5645	5504	519	498	9.05%	427	418	7.59%
	average						8.54%			8.52%

Note - Exit 5 SB off-ramp AM peak volume does not include one count that appears anomalous when compared to other counts in same hour

Red counts are from NHDOT Town summary data - 2014-2015

3.2 Existing Signal Information – Timing and Phasing

Information about the current signal timing and phasing plans at each of the signalized intersections was compiled from records available from the entity with current maintenance responsibility, which is either the NHDOT Bureau of Traffic or the Town of Derry (none of the signals in Londonderry are under their jurisdiction). Current records for one of the locations (NH Route 102/Fordway) were not readily available, so the required information was gathered in the field by observation. This information, combined with the current lane use at each location, was compiled into a data file in the SYNCHRO signal analysis program, which emulates the procedures in Volume 3 (Interrupted Flow) of the *Highway Capacity Manual* 2000 *(HCM)* (TRB, 2000) analysis procedures, for use in future analysis. The HCM 2000 procedures are being used for signalized intersections because these procedures can analyze non-standard timing and phasing parameters, since as leading pedestrian start times, which were found in the field, and to be consistent with the analyses in the Interstate Justification Report (Louis Berger, 2018).

3.3 Crash Data – 2010-2014 – Data Reduction and Summary

Data compiled by the NH Department of Safety for the last five full calendar years was made available by the NHDOT for the two study area towns. Since the crash records are identified by State Plane coordinates, this data search was narrowed further to include only those crashes located within the limits of the study area, roughly bounded by I-93 to the west, NH Route 102 to the south, NH Routes 28 and 28 Bypass north of Tsienneto Road to the north, and the Tsienneto Road/NH Route 102 intersection to the east. The records were assigned to specific roadway segments or individual intersections if sufficient locational information was available. In some cases these identifiers overlapped, so the sum of the segment and intersection crashes is more than the total.

The findings are summarized in Table 2 below. A total of 716 crashes were identified within the project area within the five-year time span, with only one fatality (a single-car incident in 2014 on NH Route 102 in Londonderry). About 24% of the crashes were injury or fatality, with almost 87% of these being on the major roadways in the study area. NH Routes 102 and 28 combined accounted for about 2/3 of the total reported crashes, averaging 48 per year, with the Interstate only accounting for 19%, or 25 per year. The traffic circle at NH Route 28 Bypass and NH Route 102 had the most reported crashes of any intersection during this period, averaging almost 5 per year.

Although there was a consistent number of crashes during three of the five years that data was compiled (between 182 and 185 per year), the other two years show wide fluctuations within this period (115 and 52 crashes). Almost 80% of the crashes involved another motor vehicle, with another 13% involving a crash with a fixed object. Seven of the crashes involved a bicyclist or pedestrian, while another six involved a crash with an animal.

TABLE 2

EXIT 4A STUDY AREA CRASH SUMMARY 2010-2014

Location	Fatal Crashes	Injury Crashes	Property Damage Only	Unknown Damage	Total Crashes
Roadways					
NH Route 102, Exit 4 to Tsienneto Road.	1	58	172	9	240
NH Route 28, Exit 5 to NH Route 102	0	40	162	9	211
I-93, Exit 4 to Exit 5	0	27	97	3	127
NH Route 28 Bypass, NH Route 102 to Auburn Town Line	0	19	39	0	58
Folsom Road/Tsienneto Road	0	3	27	2	32
TOTAL	1	147	497	23	668
% OF TOTAL	0.1%	22.0%	74.4%	3.4%	100.0%
AVG PER YEAR	0.2	29.4	99.4	4.6	133.6
Major Intersections					
NH Route 102/NH Route 28 Bypass	0	7	16	0	23
NH Route 28 Bypass/Tsienneto Road	0	3	14	0	17
NH Route 102/NH Route 28	0	3	14	0	17
NH Route 102/Fordway/High St.	0	3	12	0	15
Tsienneto Road/Pinkerton Street	0	1	10	0	11
Folsom Road/Franklin Street	0	1	8	1	10
NH Route 28/Folsom Road/Tsienneto Road/ (Ross' Corner)	0	1	9	0	10
NH Route 28/Ashleigh Dr.	0	3	6	1	10
NH Route 28/Linlew Dr.	0	0	9	0	9
NH Route 102/Londonderry Road	0	2	5	1	8
NH Route 102/Tsienneto Road	0	1	4	0	5
TOTAL	0	25	107	3	135
% OF TOTAL	0.0%	18.5%	79.3%	2.2%	100.0%
AVG PER YEAR	0	5	21.4	0.6	27
ADDITIONAL INFO BELOW					
Year					
2010	0	45	132	5	182
2011	0	32	83	0	115
2012	0	45	135	5	185
2013	0	8	40	4	52
2014	1	39	133	9	182
	1	169	523	23	716
	23.7%	(approx. percent that are injury or fatality)			

Crash Types	Number	% Total
Animal	6	0.84%
Bicyclist	2	0.28%
Fixed Object	91	12.71%
Jackknife	1	0.14%
Other Motor Vehicle	568	79.33%
Other Object	3	0.42%
Overturn	14	1.96%
Parked Motor Vehicle	9	1.26%
Pedestrian	5	0.70%
Spill (two-wheeled vehicles)	3	0.42%
Other	14	1.96%
	716	

4.0 Development of Base Traffic Networks

The time periods to be analyzed will be the 2015 AM and PM peak hours as determined by the traffic counts. The analysis will focus on operations of both the Interstate system (freeway facilities, ramp terminals, ramp merge/diverge, weaving sections) as well as local intersection Levels of Service, using the methodologies in the current version of the HCM.

There are two different approaches that need to be considered for the Interstate system versus the local roadways. The Interstate section within the study area from south of Exit 4 to north of Exit 5 is a closed system – traffic enters and exits at specific locations, so the entire system needs to balance in both directions. The local roadways are not a closed system; counts between the local intersections may not necessarily balance in most locations because there are other intervening driveways for adjacent land uses and other minor streets where traffic is able to enter or exit the network.

Interstate Volume Balancing

Within the closed Interstate system, there are two adjustments that need to be made. One is for the overall mainline/ramp system, where a starting point was chosen (in this case, at the NHDOT permanent traffic recorder location south of Exit 4) and add or subtract the on- and off-ramp volumes both northbound and southbound to develop the base AM and PM peak hour networks along I-93.

The second adjustment is to balance volumes between the ramp terminals at both Exits 4 and 5, based on the peak hour volume counts and the recent TMCs that were collected in May 2016. This second process will be discussed later in the report.

Directional counts from the I-93 permanent recorder station during May 2015 were reviewed and compiled to determine the AWDT during that period (taking the Memorial Day holiday count out of consideration). These were adjusted seasonally to develop the 2015 AWDT for both northbound and southbound traffic as the starting point. The ramp counts taken in May 2016 were also seasonally and annually adjusted to the 2015 AWDT and then added and subtracted accordingly going north and south on the Interstate. The resulting mainline 2015 AWDT volumes for the AM and PM peak hours are shown in Figures 4 and 5, respectively. The counts and calculations are provided in Appendix C.

Ramp Terminal Balancing – Exits 4 and 5

The turning movement volumes at the ramp terminals at Exits 4 and 5 must also balance between the intersections while agreeing with the overall ramp volumes. While the ramp volumes were collected with automatic traffic recorders, which only summarized data on an hourly basis, the turning movements were collected at 15-minute intervals. Furthermore, the individual intersections also have their own peak hours, which may not necessarily match the adjacent ramp or the hourly ramp volume. Therefore, an overall peak for each interchange was developed from a summary of the turning movement

counts at each location and the turning percentages applied to the balanced interstate ramp volumes derived above. The AM peak period was determined to be from 7:30-8:30, while the PM peak was from 4:45-5:45. The balanced 2015 AM and PM peak hour volumes at the two interchanges are also shown in Figures 4 and 5, respectively. The calculations are also provided in Appendix C.

Other Intersection Counts

As noted above, the local intersection turning movement counts were collected in groups of intersections in close proximity to each other to minimize significant differences between locations, even if there were intervening roadways or driveways that would not allow balancing between sites. There are only four intersections on the local network where traffic should essentially balance between adjacent intersections:

- Between Ross' Corner (NH Route 28/Folsom/Tsienneto) and at Pinkerton Street;
- Between North High Street/Madden Road and the North High Street/Folsom/ Franklin/Franklin Street Extension intersection;
- Between the NH Route 28 Bypass/NH Route 102 traffic circle and the intersection at NH Route 28 Bypass/Pinkerton Street/Perkins Street to the north; and
- Between NH Route 102/Tsienneto Road easterly to include the North Shore Road and English Range Road intersections.

Counts at these locations were balanced and all counts were adjusted to the 2015 AWDT using the NHDOT seasonal and annual factors for Group 4 Urban Highways noted above. The 2015 AM and PM peak hour volumes at the local intersections are shown in Figures 6 and 7, respectively.

5.0 Model Calibration

The SNHPC regional traffic model is an Average Annual Weekday Traffic (AAWDT) model for the greater Manchester, NH area that includes Derry and Londonderry as well as other surrounding towns. The model area has expanded since its use in the 2007 DEIS project to include towns to the south, east and west of the Exit 4A area with added roadway links and TAZs to provide traffic generation capabilities for the SNHPC's planning horizon of 2040.

However, to be a useful travel forecasting tool, the model needs to be able to replicate actual traffic volumes throughout its network within certain reasonable margins of error established by the Federal Highway Administration (FHWA) for regional traffic models. As such, the various 2015 traffic volume counts provided in Table 1 for the Exit 4A study area, among other locations in the SNHPC region, were used as a guide to test the validity of the SNHPC traffic model as a predictive tool of actual 2015 counts found in the region. This was found to be the case, and the findings of the calibration process were presented to the Exi4 4A Working Group in October, 2016. A more detailed memo describing the various calibration procedures undertaken as part of this project is included in Appendix D.

It should be noted that the current SNHPC traffic model is based on expected trip making behavior from observations of past conditions and predicting these out to a future date, in this case the 2040 design year. With the advent of autonomous/connected vehicles (AV/CVs) and the increasing likelihood of them being a larger share of the vehicle fleet within the planning horizon now covered by the model, there is much uncertainty about how and to what extent current and forecasted individual driving habits may be affected by this potentially transformative technology.

A recent study prepared by the Texas A&M Transportation Institute (Texas A&M, 2017) looked at the possible implications of AV/CVs on the transportation planning process. Some of the key modeling components they identified that could be affected by the eventual deployment of AV/CVs into the traffic stream include:

- the possible changes on the socio-economic factors that typically influence trip making and vehicle ownership;
- future characteristics of the highway network, including the effect on roadway and intersection capacity, safety and operations;
- the need to consider changes to the model area geography (e.g. traffic zones) based on possible household locational decisions;
- the possible effects on trip generation, distribution and mode choices with the availability of AV/CVs, including the likelihood of zero-occupant vehicles on the roadway network

The current transportation planning process looks at changes to demographics and roadway networks to predict future travel demands, assuming trip making will be similar to today. With AV/CVs becoming a larger component of future transportation options, the current process is not suited to predict future trip-making behavior since there is no way to reasonably predict the impact of these technologies on individual travel demand decisions. There is also the likelihood that populations that now are unable to drive or own a vehicle will have greater mobility options available to them, and therefore may result in more trips on the network than would normally be forecasted.

Therefore, until such time as traffic demand modelling on a regional basis can account for the increased deployment of AV/CVs at some critical mass to be able to better assess the impact on some/all of the trip-making factors noted above, the current transportation planning and regional travel demand modeling process is the best available option for forecasting future traffic on the roadway network for a project such as Exit 4A.

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6.0 Capacity Analyses – 2015 Base Conditions

In general, traffic analyses focus on the facilities that present the most likely constraints to overall operations on the roadway network. For interstate facilities, traffic operations are governed largely by the combination of mainline traffic flow at a given speed and number of lanes as it may be influenced by merging and diverging traffic at on and off-ramps at interchanges, as well as any weaving sections between ramps in close proximity to each other. For local roadway networks, traffic flow tends to be governed by

intersection capacity which acts to meter volumes onto adjacent roadway segments based on its ability to allow conflicting movemetns to be served.

The *2010 Highway Capacity Manual (TRB, 2010)* provide the technical procedures to analyze traffic operations of freeway facilities (basic freeways, ramp merge/diverge and weaving sections) used in this report. Chapter 10 of the *2010 HCM* defines the methodologies used to analyze typical freeway facility operations for extended lengths of continuously connected basic freeway, weaving, merge and diverge segments, such as those along I-93 in the Exit 4A study area. This methodology allows for the analysis of multiple/continuous 15-minute time periods and is capable of identifying locations where the facility may break down and the impacts of such on the rest of the facility. As such, the analysis determines where the 'weakest link' in the facility may control overall operations along a freeway network in either direction.

The 2000 *Highway Capacity Manual* (TRB, 2000) provided methodologies for signalized and unsignalized intersections, including roundabouts, that will be used to analyze the NH Route 102/NH Route Bypass 28 traffic circle. Because of the phasing and timing limitations of the existing intersections, the HCM 2000 procedures were used for the signalized and unsignalied intersection analyses, as well as to be consistent with the IJR. Chapters 18 and 19 of the *2000 HCM* define the methodologies for signalized and two-way stop controlled intersections.

The Highway Capacity Software (McTrans, 2018) as well as the SYNCHRO/Sim-Traffic programs (Trafficware, 2016) are common software packages used by traffic engineers to evaluate how traffic volumes react under interrupted and uninterrupted flow conditions under various volume, speed, traffic composition, lane use and signal timing conditions. The Level of Service (LOS) criteria for freeway facilities and intersection operations defined in the both versions of the HCM are provided in Appendix E. In general, a LOS C is considered desirable for freeway facilities operations; however, LOS D is considered acceptable for both freeways and intersection operations in urbanized areas.

6.1 Mainline Interstate Operations

The 2015 base weekday AM and PM peak hour volumes along I-93 from just south of Exit 4 to north of Exit 5 are shown in Figures 4 and 5.

The existing two-lane I-93 freeway facility was segmented along its length both northbound and southbound, based on the spacing of on- and off-ramps connecting the basic two-lane freeway segments on either side. Northbound, there were five basic freeway segments, two diverge (i.e., off-ramp) and two merge (i.e. on-ramp) segments under existing conditions. Southbound, there is one additional freeway and one more merge segment to account for the SB loop on-ramp at Exit 4 from the east and the segment between the SB on-ramps. Because of the distance between the existing interchanges, there are currently no weaving sections along I-93 in the Exit 4A study area network.

6.1.1 Mainline Freeway Segments

Five freeway segments are contained in the I-93 project study area going northbound, with a sixth one added in the southbound direction because of the additional on-ramp at Exit 4. There will be additional segments created when the Exit 4A alternatives are analyzed.

The demand and geometric factors input for segments and facility analyses include:

Demand

- Vehicles/hour
- Percent trucks and recreatonal vehicles (RVs)
- Driver population factor

Geometry

- Number of lanes
- Average lane width
- Right-side lateral clearance
- Terrain
- Free-flow speed
- Location of/distance to merge/diverge segments, with number of lanes, length of acceleration/deceleration lanes

A description of the existing facility segments and the detailed reports are summarized in Table 3 and included in Appendix F.

TABLE 3
HCS 2010 - FREEWAY FACILITIES ANALYSIS - 2015 BASE- AM AND PM PEAK HOURS

1-May-17

Segment	Northbound Direction	AM Peak Hour Level of Service (LOS)/d/c ratio			PM Peak Hour Level of Service (LOS)/d/c ratio		
		BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE
1	I-93 Mainline south of Exit 4	B/0.45			D/0.77		
2	Exit 4 NB off-ramp		B/0.26			D/0.62	
3	I-93 Mainline between Exit 4 ramps	B/0.36			B/0.50		
4	Exit 4 NB on-ramp			B/0.57			C/0.44
5	I-93 Mainline between Exit 4 NB on- and Exit 5 NB off-ramps	C/0.60			C/0.68		
6	Exit 5 NB off-ramp		C/0.27			C/0.34	
7	I-93 Mainline between Exit 5 ramps	B/0.51			C/0.57		
8	Exit 5 NB on-ramp			D/0.58			D/0.42
9	I-93 Mainline north of Exit 5	D/0.74			D/0.75		
	Facility Operations	C			C		
	Space Mean Speed (mph)	63.2			62.7		
	Density (veh/mi/hr)	19.8			24.4		
Segment	Southbound Direction						
1	I-93 Mainline north of Exit 5	D/0.74			D/0.76		
2	Exit 5 SB off-ramp		D/0.50			D/0.50	
3	I-93 Mainline between Exit 5 ramps	C/0.57			C/0.55		
4	Exit 5 SB on-ramp			C/0.31			C/0.25
5	I-93 Mainline between Exit 5 SB on- and Exit 4 SB off-ramps	C/0.69			C/0.65		
6	Exit 4 SB off-ramp		C/0.39			C/0.49	
7	I-93 Mainline between Exit 4 SB off- and SB on ramp from east	B/0.51			B/0.44		
8	Exit 4 SB on-ramp from east			B/0.33			B/0.13
9	I-93 Mainline between Exit 4 SB on-ramps	C/0.63			B/0.49		
10	Exit 4 SB on-ramp from west			C/0.40		B/0.18	
11	I-93 Mainline south of Exit 4	D/0.78			C/0.56		
	Facility Operations	C			C		
	Space Mean Speed (mph)	62.5			62.8		
	Density (veh/mi/hr)	24.4			22.1		

Note: d/c = Demand-to-capacity ratio

6.1.2 Merge/Diverge Operations

Merge/diverge operations are the result of off-ramp and on-ramp traffic leaving and/or getting onto the freeway and how the ramp traffic interacts with the mainline freeway traffic. Since all traffic on I-93 in the study area is entering or exiting in the rightmost lane, which is also where most heavy vehicles travel, this Lane 1 volume is critical to the determination of operations. The ramp spacing and order of operation (e.g. off-ramp followed by an on-ramp, as opposed to an off-ramp followed by another off-ramp) also plays a role in how and to what degree these movements impede mainline freeway traffic flow.

There are currently four merge (on-ramp) and diverge (off-ramp) arrangements in the Exit 4A study area in the northbound direction and a fifth in the southbound direction (the second SB on-ramp at Exit 4). The introduction of a new interchange between Exits 4 and 5 will add another merge and diverge in each direction. The differences between the northerly and southerly interchange alternatives and their relative proximity to Exits 4 and 5 will ultimately determine how these new ramps will affect mainline operations. Table 3 provides the analysis results for the merge/diverge operations along I-93 in the study area under 2015 AM and PM peak hour conditions.

6.1.3 Weaving Operations

Weaving operations occur on highway segments between on- and off-ramps where merging and diverging traffic conflict while completing their respective movements. This analysis is mostly governed by the distance between these ramps, the number of lanes available to make such a movement, the volumes making their respective merge and/or diverge movements, and the ability of these movements to occur independently without influencing each other. This is more of an issue in areas where there are closely spaced interchange ramps.

In the current condition, Exits 4 and 5 are more than two miles apart, so there is essentially no weaving that occurs between the ramps. With the introduction of Exit 4A to the I-93 network, weaving between the Exit 4 NB on-ramp and the Exit 4A NB off-ramp may need to be considered for the southerly interchange alternatives. However, the HCS Freeway Facilities calculations allow for an overlap of the 1500-foot ‘influence areas’ between adjacent ramps, which was included in the analyses. At this point, it does not appear that a weaving section will be created between Exit 4A and Exit 5 because of the greater spacing between them.

7.0 Signalized Intersection Operations – 2015 Base Condition

The existing signal timing/phasing information gathered earlier, combined with the current lane use at each location along with the 2015 AM and PM peak hour volumes, was compiled into a data file in the SYNCHRO (Trafficware, 2016) signal analysis program, which emulates the procedures in Volume 3 (Interrupted Flow) of the *Highway Capacity Manual* 2000 *(HCM)* analysis procedures (TRB, 2000). Because of the phasing and timing limitations of the existing intersections, the HCM 2000 procedures were used for the signalized intersection analyses. The overall delay and LOS was determined by using the HCM module in SYNCHRO, while the queuing calculation results came directly from five runs of the Sim-Traffic module within SYNCHRO per NHDOT guidance (NHDOT, 2017a). The volume-to-capacity (v/c) ratios, average delays and LOS for the signalized intersections are shown in Table 4 below. The peak queues by approach are shown in Table 5 later in this report.

Table 4
Summary of 2015 Signalized Intersection Capacity Analyses

Signalized Intersections

		AM Peak Hour			PM Peak Hour		
Intersection	**Existing Lane Use**	**v/c**	**Delay**	**LOS**	**v/c**	**Delay**	**LOS**
#1 - Exit 4 SB Off-Ramp/NH Route 102	**EB**- T, T; **WB**- T, T **SB**- L, R	0.55	17.7	B	0.67	40.2	D
#2 - Exit 4 NB Off-Ramp/NH Route 102	**EB**- L, T, T; **WB**- T, T, R **NB**- L, L, R	0.86	34.6	C	0.71	29.8	C
#3 - Exit 5 SB Off-Ramp/NH Route 28	**EB**- T, T, R; **WB**- L, T, T **SB**- L, L, R	0.74	21.0	C	0.63	21.8	C
#4 - Exit 5 NB Off-Ramp/NH Route 28	**EB**- L, T, T; **WB**- T, T, R **NB**- L, R	0.78	15.9	B	0.66	20.3	C
#6 - NH Route 102/Fordway	**EB**- T, R; **WB**- L/T; **NB**- L/R; **SB**- L/T/R	0.89	25.7	C	0.94	34.1	C
#7 - NH Routes 102/28	**EB**- L,T/R; **WB**- L,T/R; **NB**- L,T/R; **SB**- L, T, R	0.84	39.9	D	0.83	39.9	D
#11- Ross' Corner (Folsom/NH Route 28)	**EB**- L,T,R; **WB**- L,T,R; **NB**- L, T, T, R; **SB**- L, T, T, R	0.61	37.1	D	0.78	47.2	D
#13 -NH Route 28/Linlew Drive	**EB**- L/T, R; **WB**- L/T, R; **NB**- L, T, T/R; **SB**- L, T, T/R	0.41	13.3	B	0.61	18.9	B
#14 - NH Route 28/Ashleigh Drive	**EB**- L,T/R; **WB**- L, L/T, R; **NB**- L, T, T/R; **SB**- L, L, T, T,/R	0.48	16.9	B	0.72	24.0	C
#18 - NH Route 28 Bypass/ Tsienneto Road	**EB**- L,T/R; **WB**- L,T/R; **NB**- L,T/R; **SB**- L, T, R	0.80	36.5	D	0.83	35.4	D

The HCM and SYNCHRO printouts are provided in Appendices G 1-3.

The results of these analyses show which movements at the various intersections exhibit some current capacity constraints (LOS E or worse). Some of these, such as at the Exit 4 ramp terminals, will be addressed by the ongoing I-93 widening project, while issues at other local intersections may need to be addressed in some form, either through added lanes and/or optimized signal timings, by the 2040 design year. These existing deficiencies are discussed briefly below:

- Exit 4 SB Off-Ramp

  The turns from the off-ramp are the most constrained movements, with the higher-volume right turn from a single lane showing the most delay and queuing. A second right-turn lane is proposed as part of the ongoing improvements to Exit 4.

- Exit 4 NB Ramps

  The westbound thru traffic is under duress during the AM peak, while the eastbound left turn to the on-ramp is at LOS E in the PM peak. While the right turn from the off-ramp operates at a good LOS because it is not controlled by the signal, field observations show it is often impeded by either the eastbound traffic through the intersection and/or the downstream queuing of traffic on NH Route 102 east of the interchange.

- NH Route 102/NH Route 28 (Crystal Avenue/Broadway/Birch Street)

  This major crossroads in the heart of downtown Derry has several movements that exhibit substantial delays during AM and/or PM peak hours, and results in queuing along Broadway. The level of parking and pedestrian activity also affects overall traffic operations as the mix of local and through traffic results in significant congestion, even if not directly reflected in the overall capacity/LOS calculations.

  Because the reduction in this through traffic in downtown Derry is one of the primary purposes for the proposed Exit 4A project, it was necessary to find a more qualitative assessment of downtown congestion that may not be reflected in the capacity calculations. To do this, we looked at Google Maps snapshots during the course of typical weekday AM and PM peak hours (Google, 2018). These are based on real-time on-the-ground observations of travel times in the study area. The snapshots for AM and PM peak hours between Monday, January 22, 2018 and Friday, January 26, 2018 are provided in Appendix H. It should be noted that Exit 4 is currently under construction, although there should be minimal work going on during the winter when these snapshots were taken.
  These figures show regular congestion at the NH Route 102/28 intersection as well as other key intersections in the study area during any given weekday peak

hour. Congestion in and around Exit 4 is oriented westbound in the AM peak and eastbound in the PM peak, and is shown to affect other segments along Broadway in both directions to varying degrees. Key intersections along the north-south corridors of NH Route 28 and NH Route 28 Bypass, such as at Ross' Corner, Tsienneto Road, and the traffic circle at NH Route 102, appear to exhibit regular levels of delay and congestion based on this sample of peak hour travel times.

- Ross' Corner (NH Route 28/Tsienneto Road/Folsom Road)

  This intersection leads to the major commercial corridor in north Derry as well as serving as a commuter route. Traffic currently uses the Ash Street Extension and Folsom Road as an alternative route to NH Route 102 to avoid the aforementioned downtown congestion. Several turning movements experience significant delays, even with recent improvements that provided a second SB left-turn lane onto Tsienneto Road. The proximity of the Pinkerton Street unsignalized intersection just east of this location also affects overall traffic flow in this area.

- NH Route28/Ashleigh Drive

  This intersection serves as the primary access drive to the new Wal-Mart supercenter as well as other commercial establishments on the east side of NH Route 28. The heavy turning movements into and out of this town road, combined with significant commuter volumes along the NH Route 28 corridor, result in less than desirable levels of delay for several movements, particularly in the PM peak, even though the overall LOS is at LOS C.

- NH Route 28 Bypass/Tsienneto Road

  The Tsienneto Road corridor west of NH Route 28 Bypass as well as the lands adjacent to this intersection has seen a fair share of new development over the years, as well as increased use by east-west commuter traffic avoiding NH Route 102 and the downtown area. With only a single east-west lane through the intersection, calculated delays now exceed acceptable LOS thresholds for some movements during both peaks.

8.0 Unsignalized Intersection Operations

Similarly, the unsignalized intersections in the study area network were analyzed for the 2015 AM and PM peak hours using the standard 2010 HCM procedures. These results are provided in Table 6, with the printouts in Appendix I. It should be noted that the traffic circle at the intersection of NH Route 28 Bypass, NH Route 102, and East Derry Road was analyzed as a roundabout, since all turns at this location are right turns in the counterclockwise direction. The circle was evaluated using updated roundabout analysis procedures from HCM 6, published in 2016 (TRB, 2016), because it incorporates updated data from actual field operations of the growing number of roundabouts in the USA and, as such, should be more representative of local driver behavior.

As observed in the field and confirmed by the SYNCHRO analyses, left turns from the minor side streets experience significant delays due to the high volumes on the major streets, either on the State highway system or local streets such as Tsienneto Road. Of particular concern is the heavy left-turn volume exiting from Pinkerton Street onto Tsienneto Road in close proximity to the signalized intersection at Ross' Corner. Special attention will be needed to address this condition under future No-Build and Build conditions.

The table also shows the peak design queue by approach for both the signalized and unsignalized intersections, based on the 2015 capacity analysis of base conditions. This will be an important component of evaluating the future 2040 Build condition layouts under the various alternatives.

Table 5
2015 Signalized Intersection Capacity and Queuing Analyses

Signalized Intersections

Intersection	Lane Groups	AM Peak Hour 95% queue (ft)	AM v/c ratio	AM Average Delay	AM LOS	PM Peak Hour 95% queue (ft)	PM v/c ratio	PM Average Delay	PM LOS
#1 - Exit 4 SB Off-Ramp/NH Route 102	EB Thru	212	0.46	11.5	B	230	0.44	11.0	B
	WB Thru	18	0.31	1.9	A	18	0.41	1.8	A
	SB LT	251	0.64	39.5	D	317	0.69	50.4	D
	SB RT	176	0.75	13.6	B	630	1.08	80.9	F
#2 - Exit 4 NB Off-Ramp/NH Route 102	NB LT	107	0.57	46.2	D	281	0.50	33.3	C
	NB RT	0	0.15	0.2	A	0	0.41	0.8	A
	EB LT	610	0.88	43.8	D	548	0.91	62.3	E
	EB Thru	83	0.24	4.3	A	242	0.40	19.5	B
	WB Thru	448	0.97	58.7	E	250	0.76	51.5	D
#3 - Exit 5 SB Off-Ramp/NH Route 28	EB Thru	212	0.68	32.7	C	197	0.56	27.8	C
	EB RT	0	0.21	0.3	A	0	0.21	0.3	A
	WB LT	211	0.81	40.0	D	151	0.62	45.3	D
	WB Thru	59	0.43	7.0	A	52	0.28	4.8	A
	SB LT	138	0.68	29.2	C	254	0.73	36.5	D
	SB RT	148	0.78	28.7	C	63	0.45	6.2	A
#4 - Exit 5 NB Off-Ramp/NH Route 28	EB LT	251	0.86	55.0	D	223	0.72	48.4	D
	EB Thru	5	0.44	2.2	A	308	0.53	12.7	B
	WB Thru	189	0.56	26.1	C	192	0.37	27.4	C
	WB RT	0	0.53	1.3	A	0	0.38	0.7	A
	NB LT	233	0.87	49.4	D	180	0.75	44.1	D
	NB RT	0	0.10	0.1	A	143	0.77	35.2	D
#6 - NH Route 102/Fordway	EB all	247	0.12	17.7	B	591	1.00	47.1	D
	WB all	368	0.94	26.4	C	306	0.81	26.8	C
	NB all	304	0.72	51.7	D	215	0.84	36.6	D
	SB all	22	0.86	12.4	B	90	0.18	15.9	B
#7 - NH Routes 102/28	EB L	148	0.83	83.0	F	155	0.70	55.8	E
	EB T/R	170	0.42	20.1	C	393	0.73	34.2	C
	WB L	47	0.28	40.6	D	119	0.68	69.5	E
	WB T/R	385	0.88	42.7	D	272	0.67	35.1	D
	NB L	101	0.79	90.6	F	80	0.43	42.5	D
	NB T/R	274	0.85	48.3	D	316	0.86	51.3	D
	SB L	121	0.86	103.4	F	174	0.79	67.9	E
	SB Thru	188	0.61	33.9	C	346	0.77	43.3	D
	SB RT	2	0.23	1.1	A	35	0.21	3.5	A

Table 5 (Cont'd)

Signalized Intersections (cont.)

Intersection	Existing Lane Use	AM Peak Hour 95% queue (ft)	AM Peak Hour v/c ratio	AM Peak Hour Average Delay	AM Peak Hour LOS	PM Peak Hour 95% queue (ft)	PM Peak Hour v/c ratio	PM Peak Hour Average Delay	PM Peak Hour LOS
#11- Ross' Corner (Folsom/NH Route 28)	EB L	191	0.16	88.0	F	324	0.89	78.7	E
	EB Thru	169	0.27	45.1	D	310	0.73	49.0	D
	EB R	0	0.25	0.0	A	0	0.17	0.7	A
	WB L	157	0.70	66.1	E	273	1.14	165.5	F
	WB Thru	323	0.21	80.3	F	241	0.75	60.7	E
	WB R	108	0.26	8.0	A	190	0.52	16.4	B
	NB L	35	0.90	40.5	D	134	0.58	66.6	E
	NB Thru	90	0.63	25.5	C	198	0.43	40.0	D
	NB R	0	0.01	1.2	A	0	0.27	1.1	A
	SB L	131	0.74	42.0	D	248	0.76	49.7	D
	SB Thru	72	0.95	19.5	B	419	0.64	35.6	D
	SB RT	27	0.48	4.1	A	51	0.28	4.8	A
#13 -NH Route 28/Linlew Drive	EB L/T	10	0.06	33.0	C	40	0.18	39.4	D
	EB R	0	0.04	0.2	A	0	0.05	0.3	A
	WB L/T	61	0.35	40.6	D	69	0.46	48.8	D
	WB R	93	0.71	18.9	B	43	0.66	13.0	B
	NB L	0	0.00	0.0	A	36	0.19	46.3	D
	NB T/R	675	0.35	12.9	B	296	0.50	15.5	B
	SB L	63	0.35	42.8	D	125	0.64	37.4	D
	SB T/R	134	0.38	4.9	A	437	0.57	14.3	B
#14 - NH Route 28/Ashleigh Drive	EB L	20	0.12	40.8	D	60	0.54	65.2	E
	EB T/R	16	0.11	30.0	C	29	0.25	34.5	C
	WB L	110	0.52	46.5	D	232	0.84	69.2	E
	WB L/T	111	0.53	46.7	D	227	0.83	67.0	E
	WB R	38	0.22	6.0	A	63	0.29	10.9	B
	NB L	56	0.05	61.6	D	3	0.06	65.0	E
	NB T/R	183	0.50	10.1	B	311	0.69	14.8	B
	SB L	8	0.41	42.9	E	39	0.47	47.4	D
	SB T/R	285	0.35	10.3	B	234	0.60	14.0	B
#18 - NH Route 28 Bypass/ Tsienneto Road	EB L	126	0.88	77.5	E	278	0.86	54.0	D
	EB T/R	114	0.49	24.2	C	394	0.69	30.0	C
	WB L	82	0.50	41.9	D	36	0.15	35.1	D
	WB T/R	309	0.95	59.4	E	248	0.86	58.0	E
	NB L	119	0.70	57.5	E	97	0.53	44.2	D
	NB T/R	193	0.48	26.8	C	307	0.69	37.0	D
	SB L	36	0.18	35.8	D	80	0.44	42.4	D
	SB Thru	171	0.63	35.7	D	149	0.39	29.4	C
	SB R	71	0.41	7.9	A	30	0.20	2.3	A

Table 6
2015 Unsignalized Intersection Capacity and Queuing Analyses

Intersection	Existing Lane Use	AM Peak Hour 95% queue (ft)	AM v/c ratio	AM Average Delay	AM LOS	PM Peak Hour 95% queue (ft)	PM v/c ratio	PM Average Delay	PM LOS
#5 - NH Route 102/Londonderry Road	EB L	13	0.142	12.3	B	40	0.354	11.7	B
	WB L	0	0.005	8.6	A	0	0.008	10.7	B
	NB all	0	0.008	11.9	B	65	1.078	*	F
	SB L/T	20	0.253	115.0	F	68	1.130	*	F
	SB R	65	0.505	36.1	E	45	0.395	19.9	C
#8 - North High Street/Ash Street Extension	EB all	45	0.383	15.4	C	445	1.152	123.5	F
	NB LT	0	0.005	8.2	A	0	0.005	8.4	A
#9 - North High Street/Madden Road	EB all	8	0.079	18.7	C	10	0.11	27.2	D
	NB LT	0	0.000	0.0	A	0	0.00	0.0	A
#10 – North High/Folsom/Franklin Streets	EB all	3	0.035	8.3	A	3	0.043	8.4	A
	WB all	3	0.025	8.0	A	3	0.038	9.2	A
	NB all	15	0.160	14.2	B	30	0.293	23.7	C
	SB all	8	0.096	10.5	B	50	0.424	22.5	C
#12 - Tsienneto Road/Pinkerton Street	WB L	8	0.088	8.5	A	13	0.138	9.3	A
	WB L/T	0	0.000	0.0	A	0	0.000	0.7	A
	NB L	309	1.156	154.3	F	340	1.424	282.3	F
	NB R	13	0.154	11.8	B	28	0.279	15.0	C
#15 - NH Route 28/Scobie Pond Road	EB L	3	0.022	9.5	A	5	0.061	10.3	B
	SB all	183	1.011	143.2	F	318	2.116	*	F
#16 - NH Route 102/NH Route 28 Bypass/East Derry Road (Traffic Circle-RT only)	EDR WB	375	1.031	77.5	F	450	1.112	103.3	F
	28 Byp NB	175	0.781	29.5	D	525	1.268	169.4	D
	28 Byp SB	400	1.058	83.5	F	750	1.250	146.4	F
	102 EB	475	1.106	96.6	F	850	1.456	240.0	F
	102 WB	325	1.026	86.1	F	100	0.622	24.6	C
#17 - NH Route 28Bypass/ Pinkerton/Nesmith	EB L/T	125	3.388	*	F	60	0.521	69.4	F
	EB R	40	0.350	13.6	B	140	0.692	20.6	C
	WB all	245	1.371	296.3	F	73	0.599	76.5	F
	NB all	30	0.289	9.5	A	15	0.175	8.5	A
	SB all	0	0.014	8.5	A	3	0.025	8.4	A
#19 - NH Route 102/Tsienneto Road	EB L	3	0.020	9.5	A	0	0.016	8.4	A
	SB L/R	30	0.287	19.3	C	218	0.869	60.9	F

Note- Assumes 25 ft per queued vehicle
* - calculated delay exceeds 300s

9.0 Summary of SNHPC Model Assignments – 2015, 2040

The SNHPC calibration of their regional traffic forecasting model was discussed with the Traffic Working Group (TWG) in October 2016. This calibration process was based on the least-mean squared comparison of the 2015 assignments (based on the various socioeconomic characteristics of each Traffic Analysis Zone (TAZ) used by the model to generate origins and destinations to be assigned to the network) to the calculated 2015 Average Annual Weekday Traffic (AAWDT) on the key links in the study area network that were derived from the extensive traffic counting program initiated at the start of this SDEIS project. This comparison was found to fall within the FHWA's acceptable margin of error for traffic modeling as summarized in Appendix D. **As such, it was agreed by the TWG at this meeting that the model was in compliance with FHWA standards for model accuracy and could be used as a tool to reasonably project future volumes for this project.**

It was further agreed by the TWG that the relative differences between the model AAWDT assignments for 2015 and 2040 would be applied to the calculated 2015 AAWDT volumes. AM and PM peak hour volumes were to be derived as a percentage of the AAWDT as determined in both the roadway and intersection turning movement count data. AAWDT assignments at individual intersections would be used to develop any adjustments to peak hour existing turning movements, based on both the increase/decrease in traffic volume as well as any changes in turning movement percentages of any particular movement. The derivation of these future intersection volumes was completed only after consensus was reached with the TWG on the reasonableness of the 2040 AAWDT traffic assignments for each alternative.

The future model includes known/programmed roadway improvements in the SNHPC's Regional Transportation Plan - 2015-2040 (SNHPC, 2017) that includes Exit 4A; however, this interchange was not included in any of the No-Build networks. While it was recognized that there may be locations where existing/projected capacity deficiencies may exist, only those projects either programmed in the State's Ten-Year Highway Plan (NHDOT, 2018) or the Regional Transportation Plan were included in the 2040 No-Build network.

The 2040 SNHPC model assignments were developed by including the population and employment projections for each community in the SNHPC model area, as outlined in the Lane Use Scenarios report (Louis Berger, 2017) and disaggregated to the TAZ level. This report also included alternative development scenarios without and with the proposed Exit 4A interchange, notably for the Woodmont Commons development on the east side of I-93, since the development of that parcel would be directly impacted by the location of the proposed interchange. In general, the Woodmont Commons–East development was assumed to reach its build-out potential under only the southerly interchange options (A and B), and would have a lesser development scenario under the 2040 No-Build C, D, and F alternatives.

It should also be noted that the Woodmont Commons traffic impact study for the full development project submitted to the Town of Londonderry (TEC, 2013) assumed that, because of the 'live-work-play' design intent of the proposed mixed-use development, a certain percentage of site-generated trips would remain 'internally captured' within the site itself and would not be assigned to the adjacent street network outside of the development. An adjustment factor of 23% was applied to the total site traffic generation for the various proposed land uses assumed in the Woodmont Commons traffic impact study to account for this estimated internal capture rate.

However, it should be noted that the methodologies used to develop trip generation, distribution and assignments for an individual traffic impact study versus a regional model are quite different. The model applies its trip distribution and assignment algorithms directly to the trip productions and attractions generated by each TAZ, based on their socioeconomic characteristics, which does not differentiate between trips that should or should not be assigned to other TAZs. In addition, the Woodmont Commons development is included as part of several TAZs, so correcting for only some trips from a particular TAZ and not others may appear to be arbitrary and jeopardize the validity of the model.

After consultation with the NHDOT Bureau of Traffic, it was agreed, as the initial step, all the model-generated traffic from all TAZs, including Woodmont Commons, was assigned to the SNHPC model network without regard to the internal capture rate assumptions noted in their site-specific traffic impact study. (NHDOT, 2017b) This should provide a conservatively worst-case estimate of traffic being assigned to the study area roadway network. Should the design intent of Woodmont Commons be realized and less traffic is actually generated as the project evolves, overall operations would be better than projected and the design life of any proposed improvements would be extended.

Individual spreadsheets were created for the key links in the network under each 2040 alternative for purposes of calculating the projected 2040 AAWDT and AM and PM peak hour volumes, based on the relative increase/decrease between 2015 and 2040 model assignments.

9.1 AAWDT Comparisons – 2040

Table 7 presents a summary of the projected 2040 AAWDT on key links in the study area roadway network, including the I-93 mainline and all interchange ramps. As noted above, these were derived by applying the growth rate between SNHPC's 2015 and 2040 model assignments to the calculated 2015 AAWDT derived from the updated traffic counting program created for this project. These assignments also provide projected volumes for newly created road segments, including the Exit 4A on- and off-ramps as well as the connector roadway between the new proposed interchange and the existing roadway network.

TABLE 7

Adjusted 2040 AADWT volume comparison - All Alternatives

7-Apr-17
rev 1-26-18

	Loc Code	Count Location	Raw 2015 AAWDT	Adj 2015 AAWDT	2015 AAWDT Base Model Assigns	2040 AAWDT No-Build Assigns	% Growth to '15 base No-Build 2015-40	2040 No-Build AADWT	2040 AAWDT Alt A Assigns	% Growth to '15 base Alt A 2015-40	2040 Alt A AADWT	AADWT Difference Alt A vs No-Build	2040 AAWDT Alt B Assigns	% Growth to '15 base Alt B 2015-40	2040 Alt B AADWT	AADWT Difference Alt B vs No-Build	2040 AAWDT Alt C Assigns	% Growth to '15 base Alt C 2015-40	2040 Alt C AADWT	AADWT Difference Alt C vs No-Build	2040 AAWDT Alt D Assigns	% Growth to '15 base Alt D 2015-40	2040 Alt D AADWT	AADWT Difference Alt D vs No-Build	2040 AAWDT Alt F Assigns	% Growth to '15 base Alt F 2015-40	2040 Alt F AADWT	AADWT Difference Alt F vs No-Build
		Derry Locations																										
Derry	1	Crystal Av (NH 28), S of Tsienneto	15,585	15,195	13,406	10,220	-23.77%	11,584	7,242	-45.98%	8,208	-29.1%	10,565	-21.19%	11,975	3.4%	12,279	-8.41%	13,918	20.1%	13,225	-1.35%	14,990	29.4%	10,313	-23.07%	11,689	0.9%
	2	Folsom Rd W of NH 28	12,070	11,768	8,960	10,537	17.60%	13,839	29,612	230.49%	38,892	181.0%	4,730	-47.21%	6,212	-55.1%	9,494	5.96%	12,469	-9.9%	8,646	-3.50%	11,356	-17.9%	9,223	2.94%	12,113	-12.5%
	3	Pinkerton St E of Tsienneto	10,722	10,454	8,776	6,396	-27.12%	7,619	9,059	3.22%	10,791	41.6%	9,178	4.58%	10,933	43.5%	11,138	26.91%	13,268	74.1%	11,608	32.27%	13,827	81.5%	6,356	-27.58%	7,571	-0.6%
	4	Tsiennto Rd, W of NH 102	5,532	5,394	5,666	9,072	60.11%	8,636	10,824	91.03%	10,304	19.3%	16,182	185.60%	15,405	78.4%	15,529	174.07%	14,784	41.6%	11,363	100.55%	10,818	25.3%	9,191	62.21%	8,750	1.3%
	5	Tsienneto Rd E of Pinkerton	15,012	14,637	14,200	18,876	32.93%	19,457	22,226	56.52%	22,910	17.7%	15,241	7.33%	15,710	-19.3%	15,644	10.17%	16,125	-17.1%	20,041	41.13%	20,658	6.2%	18,976	33.63%	19,560	0.5%
	6	NH 102, E of NH 28 Bypass	7,456	7,270	7,016	6,126	-12.69%	6,348	6,924	-1.31%	7,175	13.0%	4,277	-39.04%	4,432	-30.2%	3,324	-52.62%	3,444	-45.7%	5,942	-15.31%	6,157	-3.0%	6,450	-8.07%	6,684	5.3%
	7	NH 28 Byp, N of Academy Dr	8,615	8,400	7,318	2,853	-61.01%	3,275	2,333	-68.12%	2,678	-18.2%	2,375	-67.55%	2,726	-16.8%	2,436	-66.71%	2,796	-14.6%	2,420	-66.93%	2,778	-15.2%	2,785	-61.94%	3,197	-2.4%
	8	NH 28 Byp, N of Tsienneto Rd	12,250	11,944	9,377	4,072	-56.57%	5,187	4,229	-54.90%	5,387	3.9%	2,696	-71.25%	3,434	-33.8%	2,290	-75.58%	2,917	-43.8%	4,218	-55.02%	5,373	3.6%	4,145	-55.80%	5,280	1.8%
	9	NH 28 Byp, S of Thornton Rd S.	14,341	13,982	12,227	7,327	-40.08%	8,379	7,652	-37.42%	8,750	4.4%	7,791	-36.28%	8,909	6.3%	8,741	-28.51%	9,996	19.3%	8,136	-33.46%	9,304	11.0%	7,191	-41.19%	8,223	-1.9%
	10	NH 102 E of Griffin St	16,000	16,820	18,002	20,810	15.60%	19,444	16,885	-6.20%	15,776	-18.9%	16,759	-6.90%	15,659	-19.5%	16,330	-9.29%	15,258	-21.5%	18,591	3.27%	17,370	-10.7%	24,147	34.14%	22,562	16.0%
	11	NH 102 W of Abbot St	14,000	14,350	11,128	14,902	33.91%	19,217	15,442	38.77%	19,913	3.6%	11,283	1.39%	14,550	-24.3%	9,968	-10.42%	12,854	-33.1%	11,885	6.80%	15,326	-20.2%	15,829	42.24%	20,412	6.2%
	12	Fordway over Beaver Brook	5,200	5,330	5,114	3,511	-31.35%	3,659	4,748	-7.16%	4,949	35.3%	4,273	-16.45%	4,453	21.7%	4,206	-17.76%	4,384	19.8%	3,926	-23.23%	4,092	11.8%	3,595	-29.70%	3,747	2.4%
	13	Franklin St Ext, N. of Folsom Rd	1,800	1,845	1,254	1,959	56.22%	2,882	1,367	9.01%	2,011	-30.2%	4,736	277.67%	6,968	141.8%	2,083	66.11%	3,065	6.3%	2,019	61.00%	2,971	3.1%	1,783	42.19%	2,623	-9.0%
	14	Ash St at Londonderry town line	6,600	6,765	5,936	13,790	132.31%	15,716	6,065	2.17%	6,912	-56.0%	5,923	-0.22%	6,750	-57.1%	8,843	48.97%	10,078	-35.9%	8,511	43.38%	9,700	-38.3%	12,825	116.05%	14,616	-7.0%
	15	Crystal Av (NH 28), S of Rollins St	13,000	13,000	13,215	10,463	-20.82%	10,293	11,087	-16.10%	10,907	6.0%	11,110	-15.93%	10,929	6.2%	11,753	48.97%	10,078	-2.1%	11,998	-9.21%	11,803	14.7%	11,022	-16.59%	10,843	5.3%
		NH 102, at Derry/Chester town line	8,200	8,200	10,839	12,783	17.94%	9,671	14,181	30.83%	10,728	10.9%	14,668	35.33%	11,097	14.7%	14,002	-11.06%	11,562	19.6%	14,138	30.44%	10,696	10.6%	12,808	18.17%	9,690	0.2%
		Londonderry Locations																										
L-derry	16	NH 102, E of Hampton Dr	32,000	32,000	30,418	51,401	68.98%	54,074	56,306	85.11%	59,234	9.5%	56,263	84.97%	59,189	9.5%	50,680	66.61%	53,316	-1.4%	51,066	67.88%	53,722	-0.7%	52,565	72.81%	55,299	2.3%
	17	NH 102, E of Exit 4		26,800	20,818	32,410	55.68%	41,723	15,723	-24.47%	20,241	-51.5%	16,852	-19.05%	21,694	-48.0%	18,986	-8.80%	24,442	-41.4%	20,775	-0.21%	26,745	-35.9%	34,151	64.05%	43,964	5.4%
	18	NH 102 at Derry/L'derry Town line	22,656	22,090	22,983	29,904	30.11%	28,742	20,413	-11.18%	19,620	-31.7%	20,908	-9.03%	20,096	-30.1%	21,661	-5.75%	20,819	-27.6%	23,215	1.01%	22,313	-22.4%	32,520	41.50%	31,256	8.7%
	19	NH 28 at Derry/L'derry Town line	17,324	16,891	19,392	15,638	-19.36%	13,621	9,440	-51.32%	8,223	-39.6%	8,125	-58.10%	7,077	-48.0%	42,458	118.95%	36,982	171.5%	40,462	108.65%	35,244	158.7%	15,477	-20.19%	13,481	-1.0%
	20	NH 28 N of Liberty Dr	13,000	13,000	15,406	14,733	-4.37%	12,432	9,984	-35.19%	8,425	-32.2%	8,697	-43.55%	7,339	-41.0%	4,904	-68.17%	4,138	-66.7%	4,757	-69.12%	4,014	-67.7%	14,584	-5.34%	12,306	-1.0%
	21	Gilcreast Rd N of NH 102	10,070	9,818	9,397	16,438	74.93%	17,174	15,318	63.01%	16,004	-6.8%	15,035	60.00%	15,709	-8.5%	15,112	60.82%	15,789	-8.1%	14,742	56.88%	15,402	-10.3%	16,006	70.33%	16,723	-2.6%
	22	Londonderry Rd, N of NH 102		4,622	4,742	4,823	1.71%	4,701	6,536	37.83%	6,371	35.5%	6,034	27.25%	5,881	25.1%	7,633	60.97%	7,440	58.3%	7,354	55.08%	7,168	52.5%	4,521	-4.66%	4,407	-6.3%
	23	Ash St E of Londonderry Rd	6,900	6,900	5,949	14,001	135.35%	16,239	6,065	1.95%	7,035	-56.7%	5,923	-0.44%	6,870	-57.7%	8,682	45.94%	10,070	-38.0%	8,457	42.16%	9,809	-39.6%	13,023	118.91%	15,105	-7.0%
		Connector Rd, E. of Exit 4A (L'derry)	-	-					53,720				54,523				38,516				36,728				0			
		Connector Rd, W. of N High St (Derry)	-	-					40,974																			
		Connector Rd, W. of NH 28 (Derry)	-	-									35,565															
		Connector Rd, E. of NH 28 (Derry)	-	-									16,193				13,888											
		Connector Rd, N. of NH 102 (Derry)											16,182				15,529											
	24	Exit 4 NB Off-ramp	10,249	9,993	10,389	20,215	94.58%	19,444	18,073	73.96%	17,384	-10.6%	18,135	74.56%	17,444	-10.3%	18,728	80.27%	18,014	-7.4%	19,497	87.67%	18,754	-3.5%	20,417	96.53%	19,639	1.0%
	25	Exit 4 NB On-ramp	10,303	10,045	9,550	21,343	123.49%	22,449	15,150	58.64%	15,935	-29.0%	17,638	84.69%	18,552	-17.4%	15,903	66.52%	16,727	-25.5%	15,411	61.37%	16,210	-27.8%	21,378	123.85%	22,486	0.2%
	26	Exit 4 SB Off-ramp	9,862	9,615	8,157	18,349	124.95%	21,629	13,795	69.12%	16,261	-24.8%	14,795	81.38%	17,439	-19.4%	12,694	55.62%	14,963	-30.8%	12,431	52.40%	14,653	-32.3%	18,730	129.62%	22,078	2.1%
	27	Exit 4 SB On-ramp - EB to SB	5,310	5,177	4,907	10,778	119.65%	11,371	11,836	141.21%	12,487	9.8%	11,659	137.60%	12,301	8.2%	10,850	121.11%	11,447	0.7%	10,881	121.74%	11,480	1.0%	10,705	118.16%	11,294	-0.7%
	28	Exit 4 SB On-ramp - WB to SB	4,767	4,648	3,637	7,402	103.52%	9,460	3,879	6.65%	4,957	-47.6%	4,125	13.42%	5,272	-44.3%	5,140	41.33%	6,569	-30.6%	5,152	41.66%	6,584	-30.4%	7,494	106.05%	9,577	1.2%
		Exit 4A NB Off-ramp	-	-					8,732		8,732		9,488		9,488		2,795		2,795		1,504		1,504					
		Exit 4A NB On-ramp	-	-					15,240		15,240		13,208		13,208		13,410		13,410		13,630		13,630					
		Exit 4A SB Off-ramp	-	-					18,996		18,996		19,376		19,376		17,290		17,290		16,972		16,972					
		Exit 4A SB On-ramp	-	-					10,752		10,752		12,450		12,450		5,021		5,021		4,621		4,621					
																									6,256			
	29	Exit 5 NB Off-ramp	5,745	5,601	4,430	6,401	44.49%	8,093	7,521	69.77%	9,509	17.5%	7,036	58.83%	8,896	9.9%	6,626	49.57%	8,377	3.5%	7,054	59.23%	8,919	10.2%	13,329	41.22%	7,910	-2.3%
	30	Exit 5 NB On-ramp	9,580	9,341	9,101	13,499	48.32%	13,855	10,863	19.36%	11,149	-19.5%	10,468	15.02%	10,744	-22.5%	7,829	-13.98%	8,035	-42.0%	7,985	-12.26%	8,196	-40.8%	12,249	46.46%	13,680	-1.3%
	31	Exit 5 SB Off-ramp	9,520	9,282	9,234	13,577	47.03%	13,648	7,670	-16.94%	7,710	-43.5%	6,036	-34.63%	6,067	-55.5%	5,728	-37.97%	5,758	-57.8%	5,790	-37.30%	5,820	-57.4%	5,882	32.65%	12,313	-9.8%
	32	Exit 5 SB On-ramp	5,645	5,504	3,919	5,884	50.14%	8,264	6,879	75.53%	9,661	16.9%	5,355	36.64%	7,521	-9.0%	5,916	50.96%	8,309	0.5%	5,879	50.01%	8,257	-0.1%		50.09%	8,261	0.0%
		I-93, south of Exit 4 (DOT PATR)		71,060	72,378	118,908	64.29%	116,743	123,109	70.09%	120,867	3.5%	123,558	70.71%	121,308	3.9%	119,322	64.86%	117,149	0.3%	119,380	64.94%	117,206	0.4%	119,129	64.59%	116,960	0.2%
		NB			36,417	59,234	62.65%	-	61,455	68.75%	-		61,615	69.19%	60,470		59,601	63.66%	-		59,527	63.46%	-		59,424	63.18%	-	
		SB			35,961	59,674	65.94%	-	61,654	71.45%	-		61,943	72.25%	60,839		59,721	66.07%	-		59,853	66.44%	-		59,705	66.03%	-	
		I-93, between Exits 4 and 4A		71,000	71,152	120,205	68.94%	119,948	118,266	66.22%	118,013	-1.6%	122,072	71.57%	121,811	1.6%	113,200	59.10%	112,958	-5.8%	111,723	57.02%	111,484	-7.1%	120,621	69.53%	120,363	0.3%
		NB			35,578	60,363	69.66%	0	58,532	64.52%	-		61,119	71.79%	-		56,776	59.58%	-		55,441	55.83%	-		60,385	69.73%	-	
		SB			35,574	59,842	68.22%	0	59,734	67.91%	-		60,953	71.34%	-		56,424	58.61%	-		56,282	58.21%	-		60,236	69.33%	-	
		I-93, between Exits 4A and 5		71,000	71,152	120,205	68.94%	119,948	133,018	86.95%	132,734	10.7%	132,718	86.53%	132,434	10.4%	136,083	91.26%	135,792	13.2%	136,200	91.42%	135,909	13.3%	120,621	69.53%	120,363	0.3%
		NB			35,578	60,363	69.66%	-	65,040	82.81%			64,839	82.24%			67,390	89.41%			67,567	89.91%			60,385	69.73%	-	
		SB			35,574	59,842	68.22%	-	67,978	91.09%			67,879	90.81%			68,693	93.10%			68,633	92.93%			60,236	69.33%	-	
		I-93, north of Exit 5		76,000	81,139	134,995	66.37%	126,445	137,153	69.03%	128,466	1.6%	136,851	68.66%	128,183	1.4%	137,099	68.97%	128,416	1.6%	137,042	68.90%	128,362	1.5%	135,061	66.46%	126,507	0.0%
		NB			40,250	67,460	67.60%	-	68,383	69.90%	-		68,290	69.66%	-		68,593	70.42%	-		68,497	70.18%	-		67,458	67.60%	-	
		SB			40,889	67,535	65.17%	-	68,770	68.19%	-		68,561	67.68%	-		68,506	67.54%	-		68,545	67.64%	-		67,603	65.33%	-	
				Adj 2015 AAWDT	2015 AWDT Base Model Assigns	2040 AAWDT No-Build Assigns	% Growth 2015-40	2040 No-Build AADWT	2040 AWDT Alt A Assigns	% Growth 2015-40	2040 Alt A AADWT	AADWT Difference Alt A vs No-Build	2040 AWDT Alt B Assigns	% Growth 2015-40	2040 Alt B AADWT	AADWT Difference Alt B vs No-Build	2040 AWDT Alt C Assigns	% Growth 2015-40	2040 Alt C AADWT	AADWT Difference Alt C vs No-Build	2040 AWDT Alt D Assigns	% Growth 2015-40	2040 Alt D AADWT	AADWT Difference Alt D vs No-Build	2040 AWDT Alt F Assigns	% Growth 2015-40	2040 Alt F AADWT	AADWT Difference Alt F vs No-Build

9.1.1 No-Build Conditions

A review of the table indicates that there is a reduction in trips on north-south roadways such as NH Route 28 Bypass, NH Route 28 and Fordway under No-Build conditions. This appears to be as a result of the additional capacity provided by the widening of I-93 to four lanes each way which allows through traffic to use the interstate for these north-south trips as opposed to the local roadways through Derry. Mainline volumes on I-93 increase by between 64-68% from 2015 and 2040, which is about a 2.5% annual growth rate. Volumes on the Exit 4 ramps increase between 95-125% from 2015 to 2040, while ramp volumes at Exit 5 only grow between 45-50% during the same period. This would appear to indicate the influence of the Woodmont Commons development in Londonderry on both sides of the Interstate being accessed from either side of Exit 4, and is also reflected in volume increase on NH Route 102 west of the interchange. Local roads in the Woodmont area, such as Gilcreast Road and Ash Street, also experience marked increases in traffic volumes under 2040 No-Build conditions.

9.1.2 Alternative A

Mainline volumes on I-93 show slightly higher growth rates under 2040 conditions with Exit 4A –Alternative A in place than in the No-Build condition. This is driven in part by Woodmont Commons because this development is assumed to reach its maximum potential with Alternative A in place, as opposed to either No-Build or most other Exit 4A options.

Exit 4 ramp volumes are affected to differing degrees with Alternative A in place. Growth rates for the NB on-ramp and SB off-ramp are about half what they are under the No-Build case, since this traffic is diverted to Exit 4A. The projected NB off-ramp volume of 17,385 vehicles per day (vpd), shows a 10% reduction over 2040 No-Build volumes. The development of Woodmont Commons to the west is reflected in the 10% increase in SB on-ramp volumes from the west side of the interchange, whereas the SB on-ramp volume from the east shows a 48% reduction in traffic that is now presumably using Exit 4A.

Exit 5 ramp volumes show greater increases on the NB off-ramp and SB on-ramp under Alternative A compared to the No-Build case. This would indicate increased interaction between Exit 4A and 5 to and from the north more than between Exits 4 and 4A, which is consistent with the findings in the previous DEIS for this project. (FHWA, 2007) The Exit 5 SB off-ramp actually shows a 43.5% reduction in traffic compared to No-Build, indicating that this traffic is likely continuing on the mainline down to Exit 4A. The NB on-ramp traffic volume is also about 20% lower than under No-Build conditions, indicating redistribution of some NB trips to Exit 4A and away from NH Route 28.

Exit 4A volumes range between 8,700-10,700 vehicles per day (vpd) on the NB off-ramp and SB on-ramp, and from 15,200 to 19,000 vpd on the NB on-ramp and SB off-ramp, respectively. The two northerly-oriented ramps have the higher volumes, consistent with the increased interaction between the new interchange and Exit 5. The projected volume on the connector road east of the Alternative A interchange is 53,700 vpd.

The local roadways are also affected by the introduction of a new interchange to the regional network. Volumes on NH Route 102 just east of Exit 4 are about half of the projected 2040 No-Build condition, while volumes closer to the downtown area show reductions of around 19%. Folsom Road shows significant increases, since it is now the primary connection between the new interchange and the local street network. Some of this increase continues easterly along the Tsienneto Road corridor (+3000 vpd over No-Build) and NH Route 102 east at the Chester town line (+1000 vpd over No-Build).

9.1.3 Alternative B

Mainline volumes on I-93 under this scenario show similar growth rates as Alternative A as compared to 2040 No-Build conditions. This is consistent with the earlier DEIS when comparing southerly versus northerly interchange locations.

Exit 4 ramp volumes show some differences as compared to Alternative A. Projected volumes on the NB on-ramp and SB off-ramp are slightly higher under Alternative B than A, but still 17-19% less than what they are under the No-Build case. This may be because Alternative B provides a section of new roadway onto the Derry street network, which may attract more traffic. The NB off-ramp shows a 10% volume reduction under Alternative B than under No-Build, similar to Alternative A. This development of Woodmont Commons to the west is reflected in an 8% increase in SB on-ramp volumes from the west side of the interchange, whereas the SB on-ramp volume from the east shows about a 44% reduction in projected traffic, similar to Alternative A.

Exit 5 ramp volumes show smaller increases on the NB off-ramp and SB on-ramp than under Alternative A. This continues to indicate the increased interaction between Exit 4A and 5 to and from the north more than between Exits 4 and 4A, which is consistent with the previous DEIS for this project. The Exit 5 SB off-ramp actually shows a greater reduction in traffic under Alternative B than under A, and this is reflected in a similarly higher volume at the Exit 4A SB off-ramp as compared to Alternative A. The Exit 5 NB on-ramp traffic is also lower than under No-Build conditions or Alternative A, indicating redistribution of some NB trips to Exit 4A and away from NH Route 28. These results appear to show that this alternative supports more of a north-south trip pattern than the east-west pattern exhibited under Alternative A.

Exit 4A volumes with Alternative B range between 9,500-12,400 vpd on the NB off-ramp and SB on-ramp, and from 13,200 to 19,400 vpd on the NB on-ramp and SB off-ramp, respectively. The SB on- and off-ramp volumes are higher than under Alternative A, but the NB on-ramp traffic is slightly lower than under Alternative A. The projected connector road volume east of the Alternative B interchange are about 54,500 vpd, and decrease to 16,200 vpd east of NH Route 28 along the Ashleigh Drive alignment.

The projected volumes on the local roadways under Alternative B have similar but generally slightly lower volumes than Alternative A. Volumes on NH Route 102 just east of Exit 4 are about 48% of the projected 2040 No-Build condition, while volumes closer to the downtown area show reductions around 19%. Folsom and Tsienneto Roads do not see the same increases as under Alternative A, since the new main connection road goes north of this area to intersect with Franklin Street Extension and Ashleigh Drive on the new alignment. The existing Tsienneto Road corridor sees minimal change since Alternative B creates a new roadway for the east-west traffic that currently uses this roadway to access the Interstate, but traffic volumes at the east end of the study area are higher than under Alternative A.

9.1.4 Alternative C

Mainline volumes on I-93 south of Exit 5 under this scenario show slightly higher growth rates than the southerly interchange alternatives (A and B) when compared to 2040 No-Build conditions. Projected volumes north of Exit 5 are consistent across all interchange alternatives, being slightly higher than No-Build.

Exit 4 ramp volumes under this alternative are slightly lower than the southerly interchange options, notably on the NB on-ramp and SB off-ramp, but higher for the SB on-ramp from the east than either Alternative A or B. This is likely indicative of the increased distance of the northerly interchange from the NH Route 102 corridor and the expectation of less effectiveness in reducing east-west traffic through the downtown area.

Impacts on Exit 5 ramp volumes show larger reductions in both the NB on-ramp and SB off-ramp volumes than the southerly interchange options. This makes sense, given the greater proximity of Alternatives C (and D) to Exit 5, which further emphasizes the increased interaction between Exit 4A and 5 to and from the north more than between Exits 4 and 4A, which is consistent with the previous DEIS for this project.

Exit 4A ramp volumes for trips to/from the south with Alternative C are noticeably lower than with the southerly interchange options, ranging between 2,800-5,000 vpd on the NB off-ramp and SB on-ramp. Trips on the NB on-ramp are similar to Alternative B but are lower on the SB off-ramp, respectively. The projected connector road volume east of the C interchange is less than under A or B (about 38,500 vpd), and decrease to 13,900 vpd west of NH Route 28 along the Ashleigh Drive alignment.

The projected volumes on the local roadways under Alternative C have similar but slightly larger volume reductions than Alternatives A or B. Volumes on NH Route 102 just east of Exit 4 are slightly lower than 2040 No-Build volumes but slightly higher than 2015 base conditions. Volumes further east on NH Route 102 show slightly larger reductions than under A or B. With the main connection road going north to NH Route 28 near the town line, volumes on this section of NH Route 28 more than double than under existing conditions. The existing Tsienneto Road corridor sees similar volume levels as Alternative B since C follows the new roadway to serve this east-west traffic demand.

9.1.5 Alternative D

Mainline volumes on I-93 under this scenario show similar growth rates as Alternative C as compared to 2040 No-Build conditions. This is consistent with the earlier DEIS where comparing southerly versus northerly interchange locations. Exits 4 and 5 ramp volumes under this option are also quite similar to Alternative C.

Exit 4A volumes with Alternative D are similar to Alternative C - the NB off-ramp and SB on-ramp volumes are lower than Alternative C but the SB off-ramp traffic is slightly higher. The projected connector road volume east of the Alternative D interchange is about 36,700 vpd.

The projected volumes on the local roadways under Alternative D have similarly but generally slightly lower reductions than Alternatives A or B. Volumes on NH Route 102 just east of Exit 4 are about the same as under 2015 base conditions, even if slightly lower than 2040 No-Build volumes. Volumes further east on NH Route 102 show smaller traffic reductions than any of the other interchange options. With the main connection road going north to NH Route 28 near the town line, volumes along this part of the NH Route 28 corridor more than double over existing conditions. The existing Tsienneto Road corridor also sees marked growth over existing volumes with this option since it follows the present roadway for east-west traffic.

9.1.6 Alternative F

Alternative F is essentially the Transportation Systems Management (TSM) option, which from the traffic model's perspective is essentially a third lane along NH Route 102 to provide some additional capacity at intersections east of Exit 4 into downtown Derry.

Mainline volumes on I-93 under this scenario show similar growth rates compared to 2040 No-Build conditions and lower than with an interchange alternative. This is consistent with the lower growth scenario as compared to those with a new interchange. Exits 4 and 5 ramp volumes under this option are also quite similar to 2040 No-Build conditions. With the provision of some additional capacity along the existing NH Route 102 corridor easterly into downtown Derry, traffic volumes are

higher than under No-Build conditions or with any of the interchange alternatives, so it does not meet the Purpose and Need for the project.

Figures 8 through 12 graphically show these volume comparisons by alternative for key areas of interest as part of this study: the Exit 4 ramps, Exit 5 ramps, Exit 4A ramps, points along the NH Route 102 corridor, and other local streets of interest, respectively.

9.2 Composition of Through Traffic in Downtown Derry

While the volume reductions may not be as profound on the surface as one might expect, it is the composition of the trips in the downtown area that are of interest, since one of the Purposes and Needs of the project is to reduce through traffic in downtown Derry that had neither an origin nor destination there. Existing travel patterns suggest that a good deal of existing traffic is already finding alternative routes to avoid the downtown area.

To test the sensitivity of the hypothesis of a reduction in 'through' traffic as a result of a new interchange, a link on NH Route 102 just west of the main downtown area, which is the location east of Griffin Street near the Beaver Brook bridge, was chosen as a representative location of downtown traffic. The SNHPC model can generate trip tables that will provide the origin and destination zone for trips on any link in the network in either direction. This traffic pattern was evaluated by comparing the number of trips from zones and external stations from the east and northeast that are currently assigned to that link under existing (2015) base, 2040 No-Build and 2040 –Alternative A conditions, which was the Preferred Alternative in the previous DEIS for this project, that might be diverted to another route/path under any Build scenario.

A series of TAZs from the SNHPC traffic model area to the east and northeast were aggregated to see how many trips remained on this link under the different scenarios, as shown in Figures 13 and 14. The ones of primary interest were noted as follows:

- North Derry – TAZs 121-124, 126, 127
- East Derry – TAZs 128-130, 145-147, 221, 225
- Chester – TAZs 148-155
- Raymond/Deerfield/Candia – TAZs 156-191
- External Stations east and northeast – Stations 308-324

Table 8 shows a summary of the assigned trips to this link in each direction as well as combined under the three scenarios. In summary, the table shows that, in general, the trips to and from these zones to the east that now pass through the downtown area are lower with an interchange alternative (in this case, Alternative A) in place than under the 2040 No-Build scenario. However, since the overall link volume is reduced as well, these trips make up a slightly higher percentage of the total trips on that link than under No-Build conditions. This appears logical, because this link is likely the shortest path from these easterly zones to destinations in downtown Derry. Nevertheless, this analysis appears to show that an interchange alternative will reduce the amount of through traffic in downtown Derry for trips to and from the east and northeast.

TABLE 8

SELECT LINK ANALYSIS

NH ROUTE 102, EAST OF GRIFFIN ROAD, DERRY, NH

Eastbound (To)	N Derry	E Derry	Chester	Raymond/Candia/ Deerfield	N/NE/SE External Stations				
Traffic Zones	121-124. 126,127	128-130, 145-147, 221, 225	148-155	156-191	308-324	Target zone total	Increase over 2015 Base	Total trips on link	% of total to target zones
2015 Base	1194	642	162	293	1209	3500		8,806	39.7%
% total on link	13.6%	7.3%	1.8%	3.3%	13.7%				
2040 No-Build	1332	1056	130	78	1282	3878	1.1%	9,642	40.2%
% total on link	13.8%	11.0%	1.3%	0.8%	13.3%				
2040 Alt A	571	1235	236	146	1845	4033	1.2%	9,108	44.3%
% total on link	6.3%	13.6%	2.6%	1.6%	20.3%				
Westbound (From)	N Derry	E Derry	Chester	Raymond/Candia/ Deerfield	N/NE/SE External Stations				
Traffic Zones	121-124. 126,127	128-130, 145-147, 221, 225	148-155	156-191	308-324	Target zone total	Increase over 2015 Base	Total trips on link	% of total to target zones
2015 Base	1177	814	114	192	760	3057		9,191	33.3%
% total on link	12.8%	8.9%	1.2%	2.1%	8.3%				
2040 No-Build	1663	1465	64	37	773	4002	1.1%	11,168	35.8%
% total on link	14.9%	13.1%	0.6%	0.3%	6.9%				
2040 Alt A	307	1097	156	113	1073	2746	0.8%	7,776	35.3%
% total on link	3.9%	14.1%	2.0%	1.5%	13.8%				
Both Directions	N Derry	E Derry	Chester	Raymond/Candia/ Deerfield	N/NE/SE External Stations				
Traffic Zones	121-124. 126,127	128-130, 145-147, 221, 225	148-155	156-191	308-324	Target zone total	Increase over 2015 Base	Total trips on link	% of total to target zones
2015 Base	2371	1456	276	485	1969	6557		18,002	36.4%
% total on link	13.2%	8.1%	1.5%	2.7%	10.9%				
2040 No-Build	2995	2521	194	115	2055	7880	2.3%	20,810	37.9%
% total on link	14.4%	12.1%	0.9%	0.6%	9.9%				
2040 Alt A	878	2332	392	259	2918	6779	1.9%	16,885	40.1%
% total on link	5.2%	13.8%	2.3%	1.5%	17.3%				

9.3 Comparison to I-93 SEIS 2030 Mainline Projections

An additional comparison was made to the projected 2030 mainline volumes on I-93 as shown in the SEIS for the I-93 project (NHDOT, 2009). This document utilized the statewide traffic model that was available at the time, and also included the proposed Exit 4A Preferred Alternative as part of the network.

However, there are some major differences between the two scenarios. First, there are two different design years: the I-93 SEIS went out only to 2030 while this Exit 4A SDEIS extends out to 2040, so there are ten more years of overall growth that contributes additional traffic onto the network. Secondly, the I-93 SEIS did not account for the full Woodmont Commons development scenario included in the Exit 4A project for the Preferred Alternative, which adds a substantial number of trips to the area in and around Exit 4 and the proposed Exit 4A. Given these factors, it is expected that design hourly volumes would be higher under the 2040 case.

Table 9 shows excerpts from Tables 4-12 and 4-13 from the 2009 I-93 SEIS, which includes the projected ADT and DDHV for 2020 and 2030 from that document. The current table includes a projection of these volumes to 2040 using the same growth rates, including Exit 4A which was included in the I-93 SEIS Build condition, and the projected AAWDT and DDHV from the latest SNHPC modeling to the 2040 design year, and a comparison between the two modelling efforts.

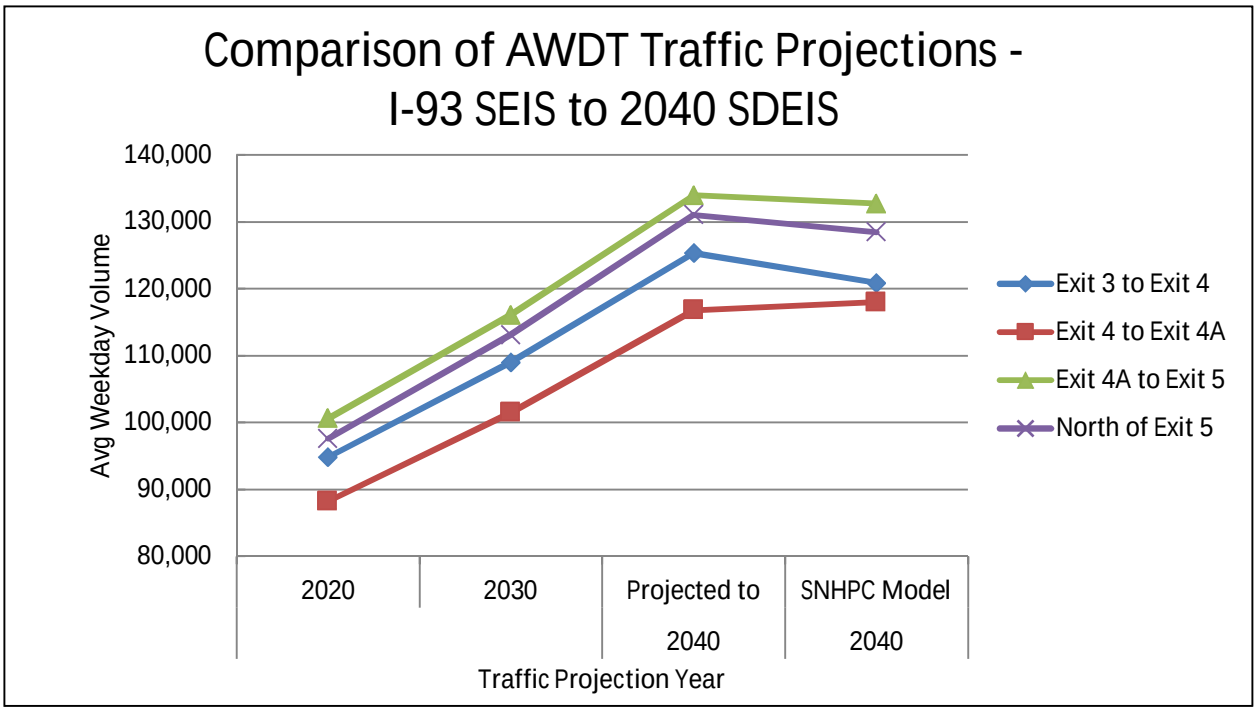
These comparisons show that the more recent SNHPC AAWDT traffic projections are consistent with the growth trend line from the I-93 SEIS if it were extended to the same 2040 design year within less than 4%. Similarly, the differences calculated DDHV extended to 2040 are within 3% when using the same methodology. The last two points on the graphs compare the 2040 projections for both the I-93 numbers and the latest SNHPC projections. Therefore, it would appear that the two modelling efforts are reasonably close to each other when extending the original I-93 design horizon out to 2040.

The original I-93 SEIS also noted that the congested flow capacity for I-93 would be 1,800 vph per lane, which would be 7,200 vph for the projected four-lane Interstate project. Should this volume be exceeded, the volumes would have to be adjusted to account for the effect of peak spreading that would likely occur into the adjacent hours before and after this demand was projected. At first glance, it appears that this scenario may also occur between Exits 4A and 5 and north of Exit 5 when using the SNHPC 2040 model projections, using the same DDHV calculation assumptions as in the I-93 SEIS. However, a more detailed review of the projected 2040 mainline volumes, which are discussed below, indicates that this 7,200 vph threshold will not likely be reached under any Exit 4A scenario.

TABLE 9
COMPARISON OF I-93 SEIS AND EXIT 4A SDEIS TRAFFIC PROJECTIONS
2020, 2030 AND 2040 DESIGN YEARS, INCLUDING EXIT 4A

Average Annual Weekday Traffic (AAWDT) Projections

	I-93 SEIS				SNHPC 2040	
I-93 Segment	2020 Build	2030 Build	Growth Rate/Year	Projected To 2040	Model Projections Alternative A	% Difference
Exit 3 to Exit 4	94,800	109,000	1.014	125,330	120,860	-3.6%
Exit 4 to Exit 4A	88,200	101,500	1.014	116,810	118,015	1.0%
Exit 4A to Exit 5	100,600	116,100	1.014	133,990	132,734	-0.9%
North of Exit 5	97,600	113,100	1.015	131,060	128,466	-2.0%



Notes:

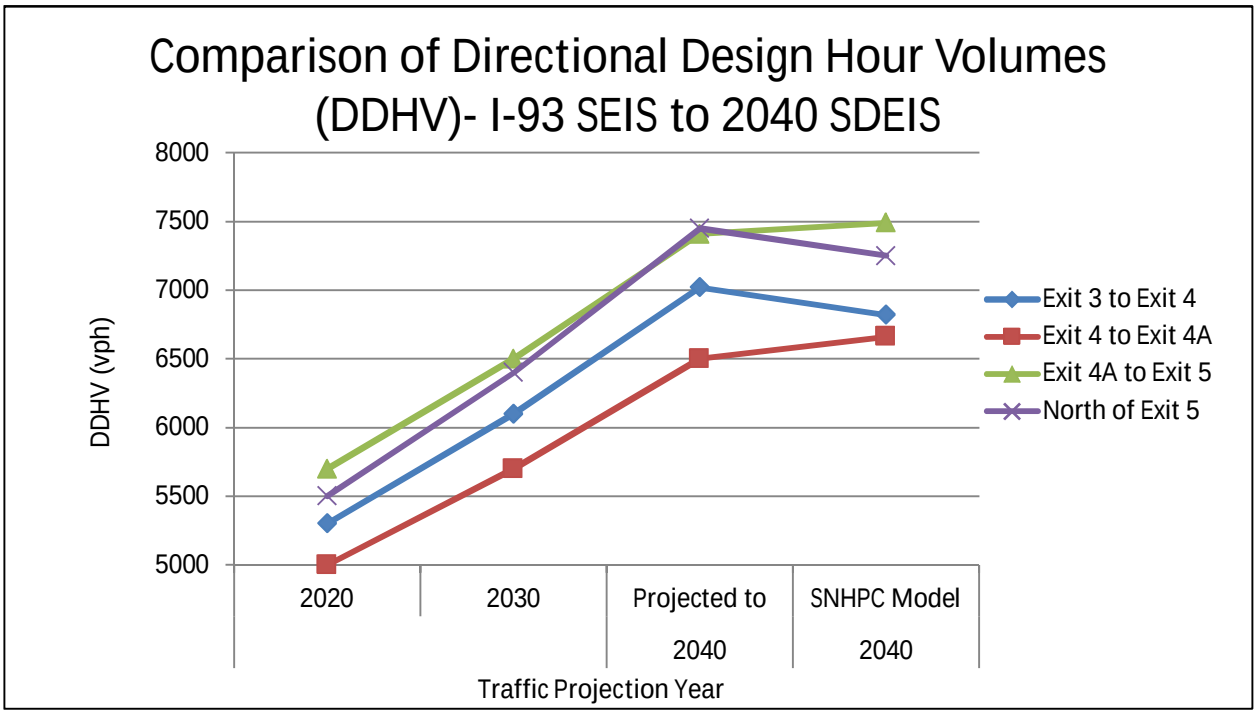
DDHV calculated as 9.4% of ADT with a 60/40 directional split, consistent with I-93 SEIS, using Scenario 2 (OEP Projections)

Source: NHDOT, Supplemental Environmental Impact Statement and Reevaluation/Section4(f) Evaluation, August 2009, Tables 4-12 and 4-13

TABLE 9 (Cont'd)
COMPARISON OF I-93 SEIS AND EXIT 4A SDEIS TRAFFIC PROJECTIONS
2020, 2030 AND 2040 DESIGN YEARS, INCLUDING EXIT 4A

Directional Design Hourly Volume (DDHV) Projections

	I-93 SEIS				SNHPC 2040	
I-93 Segment	2020 Build	2030 Build	Growth Rate/Year	Projected To 2040	Calculated DDHV Alternative A	% Difference
Exit 3 to Exit 4	5,300	6,100	1.014	7,020	6,820	-2.8%
Exit 4 to Exit 4A	5,000	5,700	1.013	6,500	6,660	2.5%
Exit 4A to Exit 5	5,700	6,500	1.013	7,410	7,490	1.1%
North of Exit 5	5,500	6,400	1.015	7,450	7,250	-2.7%



Notes:
DDHV calculated as 9.4% of ADT with a 60/40 directional split, consistent with I-93 SEIS, using Scenario 2 (OEP Projections)

Source: NHDOT, Supplemental Environmental Impact Statement and Reevaluation/Section4(f) Evaluation, August 2009, Tables 4-12 and 4-13

10.0 Derivation of 2040 Volumes for Analysis Purposes

Now that the projected 2040 AAWDT volumes have been provided by the SNHPC model and appear to be reasonable, these need to be reduced to AM and PM peak volumes for analysis purposes. Since the SNHPC model provides only daily volumes, these must be reduced to peak hours on both the I-93 mainline and interchange ramp terminals as well as at the various study area intersections that may be directly or indirectly affected by any alternative. Different procedures were used to develop these volumes to be used for analysis purposes.

As noted earlier, the full development potential of Woodmont Commons was assigned to the study area traffic model network as a worse-case scenario, but if much of the site-generated traffic is captured internally to the site - as is the design intent of this mixed-use development - operations would be better than projected and the design life of any roadway and intersection improvements would be extended.

10.1 Mainline Interstate Volumes

A different procedure was used to generate the 2040 No-Build interstate networks as was done for deriving the 2015 base network for calibration. The projected 2040 AAWDT was calculated based on the projected growth (positive or negative) reflected in the model assignments on that segment between 2015 and 2040, then this growth rate was applied to the adjusted 2015 AAWDT. Then, the 2040 projected AM and PM peak hour volumes were derived based on the percentage that the existing (2015) AM and/or PM peak hour volume was as a percentage of the adjusted 2015 AAWDT, since these percentages should not change substantially over time. These peak hour percentages generally fell in the range of 6-9% of AAWDT. Tables J-1 through J-6 in Appendix J show summary tables of the projected 2040 peak hour volumes for each alternative on the key links on the interstate and local roadway networks.

As in the 2015 base case, the most logical starting point for developing the balanced interstate networks is south of Exit 4, where NHDOT permanent recorder data should provide more reliability. The various interchange ramp volumes were then taken directly from the appropriate tables in Appendix J, and the mainline volumes were balanced through the network to the point north of Exit 5. This process was followed to develop 2040 AM and PM peak hour volumes along the Interstate for each alternative, which are shown graphically in Figures 15 through 26.

10.2 Local Intersection Volumes

A more detailed procedure was needed to derive peak hour intersection volumes for each alternative from the regional traffic model to be used for design purposes. Since the SNHPC model only provides daily volumes, a relationship needs to be established between the peak hour volumes from the actual turning movement count at any intersection and the model output that can be made available. The SNHPC model can provide daily volumes between any two nodes through one central node that would

simulate movements at an intersection. As such, information was requested from SNHPC for the daily model assignments for each study area intersection for each alternative to assist in developing turning movements at each location. Then a procedure was developed to estimate intersection turning movements at each study area location based on the existing turning movement volumes for both the AM and PM peak hours and how the total and individual turn volumes change as a result of the reassignment of traffic under any scenario. This process had to be usable regardless of alternative or the magnitude of change in traffic assignments for any movement at a specific intersection from one alternative to another. The procedure is discussed in greater detail in the memorandum dated September 29, 2017, which is attached in Appendix K. **The memo was reviewed and approved by the NHDOT before the procedure was applied to the rest of the alternatives (NHDOT, 2017c).**

The resulting AM and PM peak hour volumes for each study area intersection for each of the 2040 alternatives are provided in Figures 27 through 38.

11.0 Analysis of Interstate Operations

As in the existing case, the Freeway Facilities procedure from the *2010 HCM* and replicated in the HCS was used to evaluate the mainline interstate operations under all 2040 conditions. A free flow speed of 70 mph and a Peak Hour Factor of 0.94 were agreed upon by NHDOT (NHDOT, 2017d) to be used in the HCM analysis. With the introduction of a northerly or southerly interchanges, certain design parameters consistent with the I-93 layout were agreed upon with the NHDOT to ensure that the appropriate distances would be used in the analyses. A conceptual layout for the southerly interchange for Alternatives A and B had already been provided in the 2007 DEIS as well as part of the I-93 design between Exits 4 and 5, and was used to determine ramps spacing for analysis purposes. The previous conceptual layout for the northerly interchange for Alternatives C and D from the 2007 DEIS was used as the starting point for this study.

The HCM procedure accounts for a 1,500 foot ‘influence area’ in the ramp merge or diverge areas. With the southerly interchange, there is overlap between the influence areas of the Exit 4 NB on-ramp and the Exit 4A NB off-ramp, as well as the Exit 4A SB on-ramp and the Exit 4 SB off-ramp. As such, the HCS analysis software allows for this overlap to be considered, and is reflected in the results.

The Freeway Facilities criteria in the HCS were provided in Appendix E when the 2015 operations were discussed for the existing two-lane facility. The 2040 results for the proposed four-lane facility are summarized in Table 10 with the HCM printouts provided in Appendix L. By definition, if the demand/ capacity (d/c) ratio is greater than 1.00, ramp merge/diverge or mainline operations will be constrained, either by traffic unable to merge onto the interstate and subsequently affecting ‘topside’ operations at the ramp terminals, or by the off-ramp being unable to process the demand for exiting traffic, which may affect mainline traffic free flow speeds.

The 2040 cases where d/c ratios are 0.98 or greater, indicating potential capacity constraints to I-93 operations with a single-lane ramp, are noted below:

- Alternative A – Exit 4A SB off-ramp diverge – AM peak
- Alternative B – Exit 4A SB off-ramp diverge – AM peak
- Alternative B – Exit 4 NB on-ramp merge – AM peak
- Alternative B – Exit 4 SB off-ramp diverge – PM peak
- Alternative F – Exit 4 NB on-ramp merge – AM and PM peaks
- Alternative F – Exit 4 SB off-ramp diverge – PM peak

These results appear to reflect the increased demands from the higher development scenarios from the Woodmont Commons development under Alternatives A and B, as well as the projected limitations at the Exit 4 interchange with Alternative F in place, even with a lesser development scenario for Woodmont Commons.

If the projected Exit 4 NB on-ramp volumes reach levels where the merge with the mainline I-93 is affected as shown, it would likely result in backups of traffic back to the ramp terminal itself, affecting the topside intersections along NH Route 102. Both the Exit 4 and Exit 4A SB off-ramp diverge constraints could be ameliorated by providing a two-lane off-ramp to service the projected traffic should actual volumes meet projections in the future.

However, given the aforementioned discussion about the possible realization of the Woodmont Commons internal capture rate and the subsequent reduction in traffic assignments onto the study area network, a sensitivity analysis was conducted at the Exit 4A SB off-ramp to determine what kind of volume reduction would be needed to provide an acceptable LOS for a single-lane off-ramp at this location. If the projected off-ramp AM peak volume was reduced by only 200 vph, this ramp would function at a LOS D with a demand/capacity ratio of 0.94, which would be acceptable. Therefore, should the full impact of the traffic projections from Woodmont Commons or the overall study area development scenario not be realized, the ramps that are projected to be capacity-constrained may operate better than these analyses would indicate.

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TABLE 10
HCS 2010 - FREEWAY FACILITIES ANALYSIS - 2040 NO-BUILD AND BUILD (South Interchange) CASES - AM and PM PEAK HOURS

Segment		2040 No Build						4A Alternative A						4A Alternative B					
		AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)			AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)			AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)		
	Northbound Direction	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE
1	I-93 Mainline south of Exit 4	B/0.37			C/0.63			B/0.38			C/0.66			B/0.38			C/0.66		
2	Exit 4 NB off-ramp		A/0.26			B/0.61			A/0.23			B/0.67			A/0.23			B/0.67	
3	I-93 Mainline between Exit 4 ramps	A/0.28			B/0.37			A/0.30			B/0.42			A/0.30			B/0.42		
4	Exit 4 NB on-ramp			C/1.25			C/0.99			B/0.89			C/0.70			C/1.03			C/0.81
5	I-93 Mainline between Exit 4 on-ramp and Exit 4A off-ramp							B/0.49			C/0.56			C/0.52			C/0.59		
6	Exit 4A NB off-ramp								C/0.48			C/0.41			C/0.52			C/0.44	
7	I-93 Mainline between Exit 4A ramps							B/0.40			B/0.48			B/0.43			B/0.50		
8	Exit 4A NB on-ramp									C/0.84			C/0.72			C/0.73			C/0.48
9	I-93 Mainline between Exit 4(4A) NB on- and Exit 5 NB off-ramps	B/0.55			C/0.57			C/0.56			C/0.62			C/0.56			C/0.62		
10	Exit 5 NB off-ramp		C/0.37			C/0.49			C/0.43			D/0.58			C/0.41			D/0.54	
11	I-93 Mainline between Exit 5 ramps	B/0.48			B/0.49			B/0.49			C/0.53			B/0.49			C/0.54		
12	Exit 5 NB on-ramp			C/0.83			C/0.62			C/0.67			C/0.50			C/0.65			C/0.48
13	I-93 Mainline north of Exit 5	C/0.64			C/0.62			C/0.62			C/0.65			C/0.62			C/0.65		
	Facility operations	B			C			B			C			B			C		
	Space Mean Speed (mph)	68.4			68.6			68.5			67.9			67.6			67.9		
	Density (veh/mi/hr)	15.8			19.2			16.4			20.2			17.3			20.4		
Segment	Southbound Direction																		
1	I-93 Mainline north of Exit 6	C/0.59			C/0.64			C/0.62			C/0.62			C/063			C/0.62		
2	Exit 5 SB off-ramp		D/0.73			D/0.74			C/0.41			C/0.62			C/0.32			C/033	
3	I-93 Mainline between Exit 5 ramps	B/0.46			B/0.49			C/0.55			C/0.53			C/0.57			C/0.55		
4	Exit 5 SB on-ramp			C/0.45			C/0.38			C/0.52			B/0.44			B/0.40			B/0.34
5	I-93 Mainline between Exit 5 SB on- and Exit 4A SB off-ramps							C/0.65			C/0.61			C/0.65			C/0.62		
6	Exit 4A SB off-ramp								C/0.94			D/0.89			C/0.94			D/0.91	
7	I-93 Mainline between Exit 4A ramps							B/0.46			B/0.44			B/0.45			B/0.44		
8	Exit 4A SB on-ramp									B/0.60			C/0.51			C/0.70			C/0.58
9	I-93 Mainline between Exit 5(4A) SB on- and Exit 4 SB off-ramps	C/0.55			C/0.56			D/0.57			D/0.54			D/0.58			D/055		
10	Exit 4 SB off-ramp		C/0.84			D/1.10			D/0.76*			C/0.91			C/0.81			D/0.98	
11	I-93 Mainline between Exit 4 SB off- and SB on ramp from east	B/0.36			B/0.33			B/0.43			B/0.36			B/0.43			B/0.36		
12	Exit 4 SB on-ramp from east			B/0.66			B/0.30			B/0.49			A/0.16			B/0.37			A/0.17
13	I-93 Mainline between Exit 4 SB on-ramps	B/0.48			B/0.38			B/0.49			B/0.39			B/0.49			B/0.39		
14	Exit 4 SB on-ramp from west			C/0.85			B/0.40			C/0.93			B/0.44			C/0.92			B/0.43
15	I-93 Mainline south of Exit 5	C/0.64			B/0.46			C/0.66			B/0.47			C/0.66			B/0.47		
	Facility operations	C			C			C			C			C			C		
	Space Mean Speed (mph)	68.5			68.3			67.4			68.6			67.3			68.4		
	Density (veh/mi/hr)	18.8			19.1			20.6			18.4			20.9			18.9		

N/A

* = 2-lane off-ramp assumed

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TABLE 10 (cont.)

HCS 2010 - FREEWAY FACILITIES ANALYSIS - 2040 NO-BUILD AND BUILD (North or No Interchange) CASES - AM and PM PEAK HOURS

		2040 No Build						4A Alternative C					
		AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)			AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)		
Segment	Northbound Direction	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE
1	I-93 Mainline south of Exit 4	B/0.37			C/0.63			B/0.37			C/0.64		
2	Exit 4 NB off-ramp		A/0.26			B/0.61			A/0.24			B/0.56	
3	I-93 Mainline between Exit 4 ramps	A/0.28			B/0.37			A/0.28			B/0.39		
4	Exit 4 NB on-ramp			C/1.25			C/0.99			B/0.93			B/0.73
5	I-93 Mainline between Exit 4 on-ramp and Exit 4A off-ramp							B/0.49			C/0.54		
6	Exit 4A NB off-ramp			N/A					B/0.15			C/0.13	
7	I-93 Mainline between Exit 4A ramps							B/0.46			B/0.51		
8	Exit 4A NB on-ramp									C/0.74			C/0.63
9	I-93 Mainline between Exit 4 (4A) NB on- and Exit 5 NB off-ramps	B/0.55			C/0.57			C/0.60			C/0.64		
10	Exit 5 NB off-ramp		C/0.37			C/0.49			C/0.40			C/0.51	
11	I-93 Mainline between Exit 5 ramps	B/0.48			B/0.49			C/0.53			C/0.56		
12	Exit 5 NB on-ramp			C/0.83			C/0.62			C/0.48			C/0.36
13	I-93 Mainline north of Exit 5	C/0.64			C/0.62			C/0.63			C/0.63		
	Facility operations	B			C			B			C		
	Space Mean Speed (mph)	68.4			68.6			68.4			68.3		
	Density (veh/mi/hr)	15.8			19.2			16.4			19.7		
Segment	Southbound Direction												
1	I-93 Mainline north of Exit 6	C/0.59			C/0.64			C/0.62			C/0.61		
2	Exit 5 SB off-ramp		D/0.73			D/0.74			C/0.31			C/0.31	
3	I-93 Mainline between Exit 5 ramps	B/0.46			B/0.49			C/0.57			C/0.55		
4	Exit 5 SB on-ramp			C/0.45			C/0.38			C/0.45			C/0.38
5	I-93 Mainline between Exit 5 SB on- and Exit 4A SB off-ramps							C/0.66			C/0.63		
6	Exit 4A SB off-ramp			N/A					D/0.92			D/0.79	
7	I-93 Mainline between Exit 4A ramps							B/0.48			B/0.46		
8	Exit 4A SB on-ramp									B/0.27			B/0.23
9	I-93 Mainline between Exit 5(4A) SB on- and Exit 4 SB off-ramps	C/0.55			C/0.56			B/0.52			B/0.51		
10	Exit 4 SB off-ramp		C/0.84			D/1.10			C/0.64			C/0.76	
11	I-93 Mainline between Exit 4 SB off- and SB on ramp from east	B/0.36			B/0.33			B/0.40			B/0.34		
12	Exit 4 SB on-ramp from east			B/0.66			B/0.30			B/0.46			B/0.21
13	I-93 Mainline between Exit 4 SB on-ramps	B/0.48			B/0.38			C/0.48			B/0.38		
14	Exit 4 SB on-ramp from west			C/0.85		B/0.40				C/0.86			B/0.40
15	I-93 Mainline south of Exit 5	C/0.64			B/0.46			C/0.64			B/0.46		
	Facility operations	C			C			C			C		
	Space Mean Speed (mph)	68.5			68.3			67.9			68.5		
	Density (veh/mi/hr)	18.8			19.1			19.9			17.8		

		4A Alternative D						4A Alternative F					
		AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)			AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)		
Segment	Northbound Direction	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE
1	I-93 Mainline south of Exit 4	B/0.37			C/0.64			B/037			C/0.64		
2	Exit 4 NB off-ramp		A/0.25			B/0.59			A/0.26			B/0.62	
3	I-93 Mainline between Exit 4 ramps	A/0.28			B/0.38			A/0.28			B/0.37		
4	Exit 4 NB on-ramp			B/0.90			B/0.71			C/1.25			C/0.99
5	I-93 Mainline between Exit 4 on-ramp and Exit 4A off-ramp	B/0.48			B/0.52			B/0.55			C/0.57		
6	Exit 4A NB off-ramp		B/0.08			B/0.07							
7	I-93 Mainline between Exit 4A ramps	B/0.46			B/0.51								
8	Exit 4A NB on-ramp			C/0.76			C/0.64						
9	I-93 Mainline between Exit 4 (4A) NB on- and Exit 5 NB off-ramps	C/0.60			C/0.64								
10	Exit 5 NB off-ramp		C/0.41			D/0.55			C/0.36			C/0.48	
11	I-93 Mainline between Exit 5 ramps	C/0.53			C/0.55			B/0.49			B/0.49		
12	Exit 5 NB on-ramp			C/0.49			C/0.39			C/0.82			C/0.62
13	I-93 Mainline north of Exit 5	C/0.63			C/0.63			C/0.65			C/0.62		
	Facility operations	B			C			B			C		
	Space Mean Speed (mph)	68.6			68.4			68.4			68.6		
	Density (veh/mi/hr)	16.4			19.5			15.8			19.2		
Segment	Southbound Direction												
1	I-93 Mainline north of Exit 6	C/0.62			C/0.61			C/0.58			C/0.64		
2	Exit 5 SB off-ramp		C/0.31			C/0.32			C/0.66			C/0.67	
3	I-93 Mainline between Exit 5 ramps	C/0.57			C/0.55			B/0.47			B/0.50		
4	Exit 5 SB on-ramp			C/0.44			C/0.38			B/0.45			B/0.38
5	I-93 Mainline between Exit 5 SB on- and Exit 4A SB off-ramps	C/0.66			C/0.62			C/0.55			C/0.57		
6	Exit 4A SB off-ramp		D/0.91			D/0.78							
7	I-93 Mainline between Exit 4A ramps	B/0.48			B/0.46								
8	Exit 4A SB on-ramp			B/0.25			B/0.21						
9	I-93 Mainline between Exit 5(4A) SB on- and Exit 4 SB off-ramps	B/0.52			B/0.50								
10	Exit 4 SB off-ramp		C/0.63			C/0.75			C/0.85			D/1.12	
11	I-93 Mainline between Exit 4 SB off- and SB on ramp from east	B/0.40			B/0.34			B/0.36			B/0.33		
12	Exit 4 SB on-ramp from east			B/0.46			B/0.21			B/0.67			B/0.30
13	I-93 Mainline between Exit 4 SB on-ramps	B/0.48			B/0.38			B/0.48			B/0.38		
14	Exit 4 SB on-ramp from west			C/0.85			B/0.40			C/0.84			B/0.39
15	I-93 Mainline south of Exit 5	C/0.64			B/0.46			C/0.64			B/0.46		
	Facility operations	C			C			C			B		
	Space Mean Speed (mph)	67.9			68.6			68.5			68.4		
	Density (veh/mi/hr)	19.8			17.8			18.8			19.1		

12.0 Estimated Contribution of Woodmont Commons Traffic to Interstate Ramp Volumes

During the review of the traffic projections, the NHDOT inquired as to the potential impact that traffic from the Woodmont Commons development may have on the Exit 4 ramps under the various alternatives, since the southerly interchange alternatives (A and B) assume a higher intensity of development that under all other alternatives, including the No-Build.

As noted earlier, the 2040 projections from the SNHPC regional traffic model do not account for the same level of 'internally captured' trips within the development itself in the traffic assignments used for the Exit 4A project, as opposed to the site-specific traffic study prepared for the Woodmont project that assumed as much as a 23% internal captured trip rate in their projections and traffic assignments (TEC, 2013). Nevertheless, the model assignments should be able to present an 'order of magnitude' assessment of the relative contribution of traffic to the Exit 4 and 4A ramps from the three traffic analysis zones that Woodmont Commons would eventually occupy.

To accomplish this, SNHPC was tasked with providing 'select link' assignments to the Exit 4 and 4A ramps for trips from the three Woodmont Common zones (Zone 277 to the west, and Zones 69 and 375 to the east) under different scenarios: 2015 No-Build; 2040 No-Build; and 2040 Build with either Alternative A (southern interchange) and Alternative C (northern interchange). This information was summarized in a technical memo provided to the NHDOT for their review and concurrence (CLD, 2018), which is attached in Appendix M.

The results show that under the 2015 No-Build case, the three Woodmont zones only account for about 13% of the total traffic volume on all Exit 4 ramps, almost exclusively from the existing development in Zone 277 on the west side of I-93 in the Garden Lane area. Under the 2040 No-Build condition, the total volumes on the Exit 4 ramps would more than double, even with a lesser Woodmont development scenario, and these three zones now comprise almost 27% of this total Exit 4 ramp traffic and almost 40% of the projected increase in traffic.

With Exit 4A in place under Alternative A, which also assumes the most intense Woodmont development scenario, traffic assignments from the three subject zones account for 36% of the total Exit 4 ramp volume, most of which comes from Zone 277 on the west side. At Exit 4A, the two easterly Woodmont zones also account for 36% of total Exit 4A ramp traffic with no traffic assigned to these ramps from the west side.

With Alternative C in place, which assumes the same development scenario for Woodmont as in the 2040 No-Build case, the total traffic on the Exit 4 ramps is roughly the same as under Alternative A, but the Woodmont contribution is a slightly lower percentage (32%) of the total. At Exit 4A, Woodmont traffic would comprise only about 1% of the total ramp assignments, given that it is further removed from the traffic zones in question.

This analysis is only intended to show the relative potential contribution of Woodmont Commons traffic to both Exits 4 and 4A based on the full assignment of this traffic to the network as reflected in the SNHPC regional traffic model. As the Woodmont Commons development progresses and traffic is added to the adjacent road network, this situation should be monitored to determine how the actual additional traffic impacts affect overall traffic operations. Should the magnitude of the 'internal capture' trip rate be closer to what the TEC study anticipated, operations on the ramps, their intersections with the local road system, and the overall Interstate system would be better than by using the more conservative SNHPC model projections.

13.0 Exit 4A and Connecting Roadways

The Exit 4A interchange is currently proposed as a diamond configuration with access only to and from the east. As such, it creates two new ramp terminal intersections that will be provided with sufficient lanes to operate at an acceptable LOS. The connector road to the existing roadway network was assumed to be a four-lane limited access arterial roadway between the interchange and NH Route 28 to the east, with future breaks in access reserved for the proposed Woodmont Commons-East parcel based on their future development layout. New intersections would be created under all Build alternatives and existing intersections that would be affected by each of the respective layouts would need to be upgraded, which will be discussed in the next section.

The following is a listing of new intersections created by the connector roadway under the various interchange alternatives:

- Alternative A – Connector Road with North High Street.
- Alternative B – Connector Road with Franklin Street Extension, NH Route 28 Bypass, and relocated Tsienneto Road. In addition, the existing intersection with Ashleigh Drive will be reconfigured.
- Alternative C– Connector Road with NH Route 28 near the Londonderry town line, as well as NH Route 28 Bypass and relocated Tsienneto Road.
- Alternative D – Connector Road with NH Route 28 near Londonderry town line.

14.0 Analysis of Local Intersection Operations

Only those known programmed projects in the SNHPC 2040 Long-Range Transportation Plan (SNHPC, 2017) were included as foreseeable projects in the traffic modeling for this study. However, it is also assumed that ongoing State and Town traffic maintenance projects, such as signal retiming and optimization, will occur during the duration of the design horizon. Therefore, any intersection analyses assumes the optimization of signal timing and phasing at a specific location as a base condition, with any additional lane improvements evaluated as an impact associated with a specific alternative.

In addition, the Woodmont Commons development has also developed conceptual plans along the NH Route 102 corridor, as well as other intersections in Londonderry and Derry, to accommodate their projected traffic as that project moves forward (TEC, 2013). **The NHDOT has agreed that these projects should be considered as part of the 2040**

No-Build condition (NHDOT, 2016f). While most of these future improvements on NH Route 102 are west of Exit 4, including the Garden Lane and Gilcreast Road intersections, there are other improvements in the Exit 4A study area east of I-93 that will be considered as part of this No-Build condition for analysis purposes. These include:

- # 5 - NH Route 102/Londonderry Road intersection – signalization and lane additions, including a second east-west through lane on NH Route 102.
- # 8- North High Street/Ash Street Extension – providing a four-way stop controlled intersection, as well as separate left- and right-turn lanes exiting Ash Street, and adding an exclusive SB right-turn lane from North High Street onto Ash Street Extension.

It also should be noted that not all of the study area intersections are directly affected by the Exit 4A alternatives, even though the redistribution of traffic will have an indirect effect. Only those intersections that a specific alternative passes through were considered for any additional improvements as part of the project to maintain an acceptable LOS D or better for the overall intersection as well as on any individual approach. Analyses were conducted for all of the study area intersections, either with or without any required improvements.

It was also assumed that signalization would be required at many of the existing unsignalized locations where an alternative passes through it or where new intersections were being created at major State or local roadways. No formal signal warrants study was performed, but engineering judgment was applied to treat each of these locations the same if they were part of the layout of an alternative. Conversely, if the alternative did not go through that location, the existing traffic control was assumed to remain in place, regardless of operational efficiency, since these locations have not yet been programmed for further improvements.

15. Signalized Intersections

A summary table for the comparison of lane use and operations at each existing or proposed signalized intersection is provided in Table 11. No additional improvements to the lane use at the Exits 4 and 5 ramp terminals were investigated as part of any Build alternative, since these are being reconstructed as part of the ongoing I-93 project. The results are provided using the HCM 2000 procedures, since these procedures can address many non-standard timing and phasing parameters that later versions of the HCM cannot, as well as to be consistent with the Interstate Justification Report being conducted separately. (Louis Berger, 2018). The actual HCM and Synchro printouts for all the 2040 alternatives are provided in Appendices N through S.

Table 11
Summary of 2040 Capacity Analyses by Alternative

Signalized Intersections

Intersection	2040 Alternative	AM Peak Hour v/c ratio	AM Peak Hour Average Delay	AM Peak Hour LOS	PM Peak Hour v/c ratio	PM Peak Hour Average Delay	PM Peak Hour LOS	Comments/ Lane Use Revisions
#1 - Exit 4 SB Off Ramp/NH 102	No-Build	1.08	44.5	D	1.22	106.4	f	Current lane use per I93 project
	Alternative A	0.92	25.9	C	1.09	50.9	D	Current lane use per I93 project
	Alternative B	0.93	26.8	C	1.09	53.9	D	Current lane use per I93 project
	Alternative C	1.00	36.1	D	1.09	57.2	E	Current lane use per I93 project
	Alternative D	0.99	35.1	D	1.11	59.6	E	Current lane use per I93 project
	Alternative F	1.09	51.0	D	1.14	61.5	E	Current lane use per I93 project
#2 - Exit 4 NB Off Ramp/NH 102	No-Build	1.10	61.4	E	1.12	92.8	F	Current lane use per I93 project
	Alternative A	1.04	71.2	E	1.11	115.1	F	Current lane use per I93 project
	Alternative B	0.99	54.8	D	1.06	88.0	F	Current lane use per I93 project
	Alternative C	1.02	62.1	E	1.05	82.0	F	Current lane use per I93 project
	Alternative D	1.04	67.3	E	1.06	81.8	F	Current lane use per I93 project
	Alternative F	1.06	57.5	E	1.15	91.8	F	Current lane use per I93 project
#3 - Exit 5 SB Off Ramp/NH 28	No-Build	1.17	77.0	E	0.90	31.2	C	Current lane use per I93 project
	Alternative A	1.06	49.3	D	0.83	20.1	C	Current lane use per I93 project
	Alternative B	0.86	28.0	C	0.70	16.9	B	Current lane use per I93 project
	Alternative C	0.83	22.9	C	0.62	15.0	B	Current lane use per I93 project
	Alternative D	0.82	23.3	C	0.61	15.2	B	Current lane use per I93 project
	Alternative F	1.10	62.1	E	0.87	27.8	C	Current lane use per I93 project
#4 - Exit 5 NB Off Ramp/NH 28	No-Build	1.10	51.7	D	1.04	37.7	D	Current lane use per I93 project
	Alternative A	1.11	63.0	E	0.99	39.2	D	Current lane use per I93 project
	Alternative B	1.03	50.2	D	0.93	33.9	C	Current lane use per I93 project
	Alternative C	1.02	49.9	D	0.87	27.7	C	Current lane use per I93 project
	Alternative D	1.02	50.5	D	0.89	32.6	C	Current lane use per I93 project
	Alternative F	1.07	44.0	D	0.99	35.1	D	Current lane use per I93 project
#5 - NH Rte 102/Londonderry Rd/ St. Charles Street	No-Build	0.85	17.7	B	1.16	67.5	E	Add 2nd E-W lane per Woodmont concept
	Alternative A	0.52	11.4	B	0.58	14.8	B	Add 2nd E-W lane per Woodmont concept
	Alternative B	0.48	7.2	A	0.54	14.2	B	Add 2nd E-W lane per Woodmont concept
	Alternative C	0.52	8.2	A	0.53	13.1	B	Add 2nd E-W lane per Woodmont concept
	Alternative D	0.56	8.3	A	0.65	16.3	B	Add 2nd E-W lane per Woodmont concept
	Alternative F	0.75	12.3	B	0.87	27.9	C	Add 2nd E-W lane per Woodmont concept
#6 - NH Rte 102/Fordway/Madden Hill Road	No-Build	0.92	30.8	C	1.04	47.3	D	Current lane use
	Alternative A	0.79	23.4	C	0.99	42,5	D	Current lane use
	Alternative B	0.80	23.0	C	0.91	29.1	C	Current lane use
	Alternative C	0.78	22.3	C	0.92	30.0	C	Current lane use
	Alternative D	0.81	23.2	C	0.94	30.2	C	Current lane use
	Alternative F	0.93	28.7	C	0.96	29.9	C	Add NB LT, EB RT lanes
#7 - NH Rtes 102/28	No-Build	0.88	47.4	D	0.79	37.5	D	Current lane use
	Alternative A	0.89	55.3	E	0.84	47.9	D	Current lane use
	Alternative B	0.87	44.1	D	0.80	40.5	D	Current lane use
	Alternative C	0.77	35.0	C	0.84	40.2	D	Current lane use
	Alternative D	0.89	48.1	D	0.86	46.2	D	Current lane use
	Alternative F	0.63	28.6	C	0.83	34.0	C	Add NB LT, WB Th, EB RT lanes

Table 11 (Cont'd)
Summary of 2040 Capacity Analyses by Alternative

Signalized Intersections

Intersection	2040 Alternative	AM Peak Hour v/c ratio	AM Peak Hour Average Delay	AM Peak Hour LOS	PM Peak Hour v/c ratio	PM Peak Hour Average Delay	PM Peak Hour LOS	Comments/ Lane Use Revisions
#9A - Connector Rd/N High St	No-Build		n/a/			n/a/		Does not exist
	Alternative A	0.59	25.0	C	0.95	37.5	D	Prop lane use: EB - T,T,R; WB-L,T,T; NB- L,L,R lanes
	Alternative B		n/a/			n/a/		Does not exist
	Alternative C		n/a/			n/a/		Does not exist
	Alternative D		n/a/			n/a/		Does not exist
	Alternative F		n/a/			n/a/		Does not exist
#10 - N High/Folsom/Franklin Sts.	No-Build		n/a/			n/a/		Would remain unsignalized
	Alternative A	0.65	17.9	B	0.92	32.2	C	EB - L,T,T,TR; WB-L,T,TR; SB- LT,R; NB- L,TR lanes
	Alternative B		n/a/			n/a/		Would remain unsignalized
	Alternative C		n/a/			n/a/		Would remain unsignalized
	Alternative D		n/a/			n/a/		Would remain unsignalized
	Alternative F		n/a/			n/a/		Would remain unsignalized
#11- Ross' Corner (Folsom/NH 28)	No-Build	0.72	91.3	F	0.80	56.4	E	Current lane use
	Alternative A	0.56	22.3	C	0.79	32.9	C	Add 2nd EB LT and Th lanes; add 2nd WB Th lane
	Alternative B	0.49	28.4	C	0.66	38.3	D	Current lane use
	Alternative C	0.73	32.5	C	0.83	46.1	D	Current lane use
	Alternative D	0.73	27.0	C	0.80	35.2	D	Add 2nd EB LT lane; add 2nd WB RT lane
	Alternative F	0.61	32.6	C	0.72	42.7	D	Current lane use
#12 - Tsienneto Rd/Pinkerton St	No-Build		n/a/			n/a/		Would remain unsignalized
	Alternative A	0.61	13.7	B	0.65	12.5	B	Signalized and coord with Ross' Corner
	Alternative B		n/a/			n/a/		Would remain unsignalized
	Alternative C		n/a/			n/a/		Would remain unsignalized
	Alternative D	0.69	20.1	C	0.64	24.2	C	Signalized and coord with Ross' Corner
	Alternative F		n/a/			n/a/		Would remain unsignalized
#13 -NH 28/Linlew Dr	No-Build	0.41	18.9	B	0.48	17.2	B	Current lane use
	Alternative A	0.19	11.7	B	0.46	25.0	C	Current lane use
	Alternative B	0.36	6.3	A	0.49	13.8	B	Current lane use
	Alternative C	0.39	5.2	A	0.49	12.9	B	Current lane use
	Alternative D	0.56	14.9	B	0.78	20.4	C	Current lane use
	Alternative F	0.28	11.3	B	0.40	16.1	B	Current lane use
#14 - NH 28/Ashleigh Dr	No-Build	0.43	17.3	B	0.59	24.8	C	Current lane use
	Alternative A	0.35	17.0	B	0.48	21.7	C	Current lane use
#22 - B/C Connector/NH 28	Alternative B	0.73	26.8	C	0.83	35.6	D	Revised Lane Use: EB- L,T,R; WB- L,L,T,TR; NB-L,T,T,R,R; SB-L,T,T,R

Table 11 (Cont'd)
Summary of 2040 Capacity Analyses by Alternative
Signalized Intersections

Intersection	2040 Alternative	AM Peak Hour v/c ratio	AM Peak Hour Average Delay	AM Peak Hour LOS	PM Peak Hour v/c ratio	PM Peak Hour Average Delay	PM Peak Hour LOS	Comments/ Lane Use Revisions
#22 - B/C Connector/NH 28	Alternative C	0.71	22.0	C	0.84	29.7	C	Revised Lane Use: EB- L,L,T,TR; WB- L,T,TR; NB-L,TR; SB-LT,R
	Alternative D	0.58	21.0	C	0.84	34.8	C	Add WB RT lane to current lane use
	Alternative F	0.38	16.9	B	0.55	26.2	C	Current lane use
#18 - NH Byp 28/Tsienneto Rd	No-Build	0.69	58.1	E	0.90	112.0	F	Current lane use
	Alternative A	0.64	33.6	C	0.80	23.8	C	Add 2nd EB/WB Th lanes
	Alternative B	0.54	32.4	C	0.59	33.0	C	Current lane use
	Alternative C	0.58	23.9	C	0.79	28.4	C	Current lane use
	Alternative D	0.56	25.2	C	0.60	22.9	C	Add 2nd EB/WB Th lanes
	Alternative F	0.74	32.4	C	0.87	34.8	C	Current lane use
#19 - NH 102/Tsienneto Rd, coord w/ #26 - NH 102/North Shore Rd	No-Build *	0.53	24.9	C	1.53	247.7	F	LOS as unsignalized
	Alternative A	0.62	13.2	B	0.76	19.6	D	Add EB LT, WB RT lanes at signal
	Alternative B	0.60	11.0	B	0.61	9.9	A	Add EB LT, WB RT lanes at signal
	Alternative C	0.60	12.7	B	0.60	9.0	A	Add EB LT, WB RT lanes at signal
	Alternative D	0.63	12.1	B	0.65	6.9	A	Add EB LT, WB RT lanes at signal
	Alternative F*	0.30	24.3	C	1.46	247.5	F	LOS as unsignalized
#20 - Exit 4A SB off ramp/Connector Rd	No-Build		n/a/			n/a/		Does not exist
	Alternative A	0.97	41.2	D	0.88	28.9	C	2 SB LT lanes from off-ramp, 2 WB LT lanes to on-ramp
	Alternative B	1.04	52.3	D	0.94	34.6	C	2 SB LT lanes from off-ramp, 2 WB LT lanes to on-ramp
	Alternative C	0.73	20.1	C	0.65	18.3	B	2 SB LT lanes from off-ramp, 2 WB LT lanes to on-ramp
	Alternative D	0.70	19.2	B	0.63	18.2	B	2 SB LT lanes from off-ramp, 2 WB LT lanes to on-ramp
	Alternative F		n/a/			n/a/		Does not exist
#21 - Exit 4A NB off ramp/Connector Rd	No-Build		n/a/			n/a/		Does not exist
	Alternative A	0.93	20.4	C	0.84	16.1	B	EB - T,T; WB T,T,R,R; NB- LR,R
	Alternative B	0.97	27.5	C	0.88	15.8	B	EB - T,T; WB T,T,R,R; NB- LR,R
	Alternative C	0.65	7.9	A	0.58	7.1	A	EB - T,T; WB T,T,R,R; NB- LR,R
	Alternative D	0.59	5.7	A	0.53	5.1	A	EB - T,T; WB T,T,R,R; NB- LR,R
	Alternative F		n/a/			n/a/		Does not exist
#23 - B/C Connector Road/NH Bypass 28	No-Build		n/a/			n/a/		Does not exist
	Alternative A		n/a/			n/a/		Does not exist
	Alternative B	0.25	17.0	B	0.32	16.9	B	Prop lane use: EB- L,T,TR; WB- L,T,TR; NB- L,TR; SB-L,T,R
	Alternative C	0.37	18.5	B	0.46	20.4	C	Prop lane use: EB- L,TR; WB- L,TR; NB- L,TR; SB-L,T,R
	Alternative D		n/a/			n/a/		Does not exist
	Alternative F		n/a/			n/a/		Does not exist

Table 11 (Cont'd)
Summary of 2040 Capacity Analyses by Alternative
Signalized Intersections

Intersection	2040 Alternative	AM Peak Hour v/c ratio	AM Peak Hour Average Delay	AM Peak Hour LOS	PM Peak Hour v/c ratio	PM Peak Hour Average Delay	PM Peak Hour LOS	Comments/ Lane Use Revisions
#25 - C/D Connector Road/NH 28	No-Build		n/a/			n/a/		Does not exist
	Alternative A		n/a/			n/a/		Does not exist
	Alternative B		n/a/			n/a/		Does not exist
	Alternative C	0.81	10.6	B	0.79	12.2	B	Prop lane use: EB- L,T,T; WB- T TR, SB- L,R
	Alternative D	0.96	13.7	B	0.87	14.1	B	Prop lane use: EB- L,T,T; WB- T TR, SB- L,R
	Alternative F		n/a/			n/a/		Does not exist

#1 – Exit 4 SB off-ramp at NH Route 102
The results show that this ramp terminal as presently proposed will still experience capacity constraints into the 2040 design horizon. All 4A Build interchange alternatives appear to function better than No-Build, with Alternatives A and B doing better than the northerly or no interchange alternatives, even though they both have a higher potential development scenario for Woodmont Commons than the others. The heavy SB right turn onto NH Route 102 from the ramp, even with two lanes, combined with heavy WB flow from the NB ramps located to the east, contribute to the decline in LOS. The single left turn lane from the off-ramp also appears insufficient to handle the peak hour demands.

#2 – Exit 4 NB ramps at NH Route 102
The results show that this ramp terminal as presently proposed will also experience capacity constraints into the 2040 design horizon. All 4A Build interchange alternatives improve 2040 AM peak hour operations, with Alternatives C and D doing slightly better than Alternatives A and B in the PM peak. The heavy EB left-turn onto the on-ramp, even with two lanes, is the dominant volume at this location, as well as the NB left turn from the off-ramp. Alternatives C and D appear to operate at a slightly better LOS, but the Woodmont Commons development scenario is also less intense in these cases than under Alternatives A and B. Alternative F fares worse than any of the alternatives as proposed.

#3 – Exit 5 SB ramps at NH Route 28
The results show that this ramp terminal as presently proposed will still experience some capacity constraints into the 2040 design horizon. All 4A Build interchange alternatives provide better operations than the No-Build condition. The single WB left turn and SB right-turn lanes appear to be the constraints to better operations across all alternatives. Alternatives C and D appear to function better than No-Build or the southerly or no interchange alternatives, likely because of their proximity to this interchange and the increased likelihood of diverting some of the traffic demand, as opposed to the other alternatives.

#4 – Exit 5 NB ramps at NH Route 28
The results show that this ramp terminal as presently proposed will also experience capacity constraints into the 2040 design horizon. All 4A Build interchange alternatives provide slightly better operations than under No-Build conditions. The heavy EB left-turn demand onto the on-ramp in a single lane, as well as the single-lane NB left turn from the off-ramp, are the critical movements at this intersection. Alternatives C and D appear to operate at a slightly better LOS than Alternatives A and B, again because of their proximity to this interchange and increased likelihood of diverting some of the traffic demand. Alternative F fares worse than any of the alternatives as proposed.

#5 – NH Route 102/Londonderry Road/St. Charles Street
With the addition of a second east-west through lane on NH Route 102 as part of the proposed Woodmont Commons improvements, this intersection would operate at acceptable LOS under all alternatives. Alternative F would operate slightly worse than the other alternatives, because of projected increased traffic on NH Route 102, but would still be at an acceptable LOS.

#6 – NH Route 102/Fordway/ Madden Hill Road
This existing intersection would operate at acceptable LOS under all alternatives except Alternative F. Alternative A appears to draw more traffic to the Madden Hill Road approach that opposes the heavy Fordway volumes on the same permissive phase (where both approaches have a concurrent green light and must wait for gaps in opposing traffic to proceed), so it operates slightly worse than the other interchange alternatives, particularly in the 2040 PM peak. Alternative F would necessitate provision of lane separation out of Fordway as well as an exclusive EB right-turn lane to maintain an acceptable LOS.

#7 - NH Routes 102/28
Based solely on the capacity calculations, this existing intersection would operate at acceptable LOS under all alternatives except Alternative F. As noted earlier, there are many other unquantifiable factors in the downtown area, such as pedestrian activity and friction from side street and on-street parking maneuvers, that contribute to reduced traffic speeds and the general diversion/avoidance of the area by through traffic to other routes such as Ash Street Extension, North High Street, Folsom Road, and Tsienneto Road.

The traffic model indicates that Alternative A appears to draw more traffic to the eastern part of downtown that then makes a right turn to NH Route 28 in the direction of Exit 4A and the Woodmont Commons development. In reality, much of this traffic may divert to the traffic circle to the east and use the Pinkerton/Tsienneto corridor to complete such a trip. Other Build alternatives show similar operational/LOS characteristics than under No-Build conditions. With additional traffic through the downtown area and no interchange option, Alternative F would necessitate provision of a second NB left-turn lane, an EB exclusive right-turn lane, and a second WB thru lane to maintain an acceptable LOS in the 2040 design horizon.

#9A - Alternative A Connector Road/North High Street
This new intersection is created by the Alternative A connector road with the local street network. The existing intersection of North High Street with Madden Road would be relocated off the new connector road as a minor roadway serving the small number of residences there. It is envisioned that this new intersection would need to be signalized and widened to provide acceptable operations, given the projected traffic volumes. The Connector Road eastbound approach would consist of two thru lanes and an exclusive right-turn lane to North High Street. The Connector Road westbound approach would consist of an exclusive left-turn lane and two thru lanes. The North High Street northbound approach would

consist of two left-turn lanes and a right-turn lane. Given the projected volumes and this lane use, this intersection would operate at a LOS D in the 2040 PM peak hour.

#10 - Alternative A Connector Road/Franklin Street/Franklin Street Extension
This existing intersection is presently unsignalized and operates at a poor LOS for the north/south side street approaches, which experience difficulty entering the main traffic flow during peak periods. With the increase in development activity nearby, this condition would be exacerbated into the future to the point where there may need to be consideration of additional improvements to provide acceptable operations, even with other interchange alternatives beyond Alternative A.

With the Alternative A connector road in place, this intersection will require significant widening and signalization to provide sufficient lanes to handle the project volumes as a direct result of Exit 4A. The east/west approaches would have at least two thru lanes (the projections suggest a third lane may be needed for the eastbound approach) with exclusive left-turn lanes. The north/south approaches would have two lanes with an exclusive lane oriented to the west to handle the projected traffic. This configuration would operate at a LOS C in the 2040 PM peak hour.

#11 - Ross' Corner (NH Route 28/Folsom Road/Tsienneto Road)
This intersection was upgraded several years ago to provide a second southbound left-turn lane from NH Route 28 onto Tsienneto Road to serve the predominant southbound-to-eastbound travel demand between I-93 and Derry and points to the east. With the projected growth to 2040, the existing lane geometry will no longer be sufficient to meet the expected traffic demands.

With an Exit 4A interchange in place, and with the Alternative A connector road in particular, the existing north-south traffic orientation now becomes an east-west flow. As such, improvements to handle the increase east-west travel demand will be required. With Alternative A, a second EB left-turn lane and second EB thru lane will be needed, as well as a second WB thru lane, to provide an acceptable LOS. Alternatives B and C are on a new east-west alignment north of this intersection so no changes to the existing lane use are required. With Alternative D, the interchange is north of this intersection, so movements oriented in that direction will need to be augmented. This means the addition of a second EB left-turn lane and second WB right-turn lane at this location. Alternative F maintains the existing traffic distribution, and the existing lane use can accommodate the projected traffic volumes.

#12 - Tsienneto Road/Pinkerton Street (Alternatives A and D only)
This intersection is in close proximity (300 feet +/-) from the Ross' Corner signal, but is not currently signalized. As such, left-turn exits experience lengthy delays while waiting for a gap in the Tsienneto Road traffic flow. The eastbound right-

turn movement has been separated from the main traffic stream by a channelizing island to help exiting traffic, but the opposing traffic flow limits the number of available gaps for exiting traffic. At some point in the future, regardless of this project, this intersection may need to be signalized and coordinated with the Ross' Corner signal, but there are no defined plans to do that at this time. Therefore, except for those alternatives that directly impact this intersection, namely Alternatives A and D, the intersection is assumed to remain unsignalized and is expected to operate at a poor LOS for the minor street approach from Pinkerton Street.

For Alternatives A and D, a second lane for thru traffic would be provided in both the eastbound and westbound directions, as well as an exclusive westbound left-turn lane into Pinkerton Street. With this geometry and coordinated phasing with Ross' Corner as a cluster intersection, this location would operate at an acceptable LOS C or better in the 2040 design year.

#13 - NH Route 28/Linlew Drive
No changes to the existing lane use at this intersection are required to accommodate traffic volumes under any of the proposed alternatives.

#14/22 - NH Route 28/Ashleigh Drive/Alternative B-C Connector Road
This intersection would see significant changes depending on which alternative would be in place. For Alternatives B and C, the proposed connector road would create a new east-west roadway that would require reconfiguration of lanes to accommodate the new distribution of traffic for either a southerly or northerly interchange. Under Alternative B, the new roadway would need two thru lanes in the east-west direction, as well as double-turn lanes to and from NH Route 28 to the south, along with other lane use changes. With Alternative C, a double SB left-turn lane into Ashleigh Drive would be needed to serve traffic from the new interchange to the north and the connector road, among other lane use changes. An acceptable LOS C or better can be provided for all alternatives with the appropriate revisions to the lane use.

#18 - NH Route 28 Bypass/Tsienneto Road
The 2040 No-Build analysis shows that the existing intersection would operate at or over capacity during both peak hours, so some improvements would appear to be needed at some point in the future. Alternatives B and C reduce east-west traffic through this intersection, so the existing lane use can provide an acceptable LOS D or better in 2040. Alternatives A and D will require the addition of a second east-west thru lane to accommodate the increased east-west traffic at an acceptable LOS.

#19/26- NH Route 102/Tsienneto Road/North Shore Road (Alternatives A-D)
A review of the existing traffic counts at the North Shore Road and English Range Road intersections indicate that existing 2015 left-turn volumes currently satisfy turn-lane warrants at both locations. As such, any improvements at the Tsienneto

Road/NH Route 102 intersection associated with any of the alternatives should take this into consideration in the design.

Because existing PM peak analyses already indicate a poor LOS for exiting traffic, combined with the projected increase in left-turn volumes exiting Tsienneto Road, it has been assumed that this location will need to be signalized as part of any interchange alternative. Because of the proximity of North Shore Road, that intersection would be incorporated into the signalized intersection, similar to Ross' Corner and Pinkerton Street. An exclusive right-turn lane would be provided for NH Route 102 WB traffic entering Tsienneto Road, as well as a WB left-turn lane into North Shore Road. This left-turn lane would also be carried easterly towards the English Range Road intersection for continuity, where an EB left turn lane would be provided. There would still only be a single lane exiting Tsienneto Road, despite the higher volumes, because of the complexity of accommodating a double left-turn lane onto NH Route 102 and then tapering back to a single lane with North Shore Road being so close.

With signalization of the intersection as proposed, an acceptable LOS C or better can be provided for all interchange alternatives in the 2040 design horizon.

#20/21 - Exit 4A SB and NB Ramp Terminals (Alternatives A-D)
With either a northerly or southerly interchange, it is envisioned that both ramp terminals would be signalized as part of the diamond configuration. The SB off-ramp would have two lanes exiting the ramp, while there would be two lanes provided for the left turn onto the SB on-ramp. This ramp would be close to capacity in the 2040 AM peak hour, assuming full realization of the traffic projections on the SB off-ramp.

At the NB ramps, there would be two east-west thru lanes with a single EB left-turn lane and double WB right-turn lanes onto the NB on-ramp. On the off-ramp, there would be a shared left/right lane and an exclusive right-turn lane, since there is no access to the west. An acceptable LOS D or better can be provided at this ramp terminal under all interchange alternatives.

#23 - NH Route 28 Bypass/B-C Connector Road (Alternatives B and C)
This new intersection is created by the connector road roughly along the alignment of the existing Ashleigh Drive. With Alternative B, two east-west thru lanes need to be provided so that an acceptable LOS C can be achieved. Only one east-west thru lane is required with Alternative C because of less overall traffic volume through the intersection.

#25 - C-D Connector Road/NH Route 28 (Alternatives C-D)
This new intersection is created by the connector road from the northerly interchange where it would intersect with the existing two-lane section of NH Route 28 just north of the Derry/Londonderry town line. NH Route 28 southbound would become the minor approach to the intersection and would have

separate left- and right-turn lanes. The EB approach would have an exclusive left lane and two thru lanes, while the WB approach would have a thru lane and a shared thru/right lane. This configuration would provide a LOS B during the 2040 peak hours.

16. Unsignalized Intersections

A summary table showing a comparison of operations at each existing or proposed unsignalized intersection is provided in Table 12. In most cases, the existing or projected deficiencies for the minor street approaches are exacerbated, except where traffic diversions may reduce the volume of traffic on the major approach that would conflict with traffic turning from the minor street approach(es).

It is not envisioned that any of these intersections would warrant signals, except those that are directly impacted by a specific alternative, such as Tsienneto Road/Pinkerton Street or NH Route 102/Tsienneto Road/North Shore Road. Delays at the North High Street /Ash Street Extension and the North High Street/Folsom Road/Franklin Streets locations are excessive and should be monitored as the Woodmont Commons development progresses to determine if and when signal warrants may be satisfied.

Table 12
Summary of 2040 Capacity Analyses by Alternative
Unsignalized Intersections

Intersection	2040 Alternative	AM Peak Hour v/c ratio	AM Peak Hour Average Delay	AM Peak Hour LOS	PM Peak Hour v/c ratio	PM Peak Hour Average Delay	PM Peak Hour LOS	Comments/ Lane Use Revisions
#8 - N High St/Ash St Ext	No-Build	1.04	78.0	F	3.04	>300	F	
(Critical Movement - EB LT)	Alternative A	0.53	17.4	C	1.47	228.8	F	
	Alternative B	0.42	14.3	B	0.96	56.5	F	
	Alternative C	0.76	29.3	D	1.09	90.6	F	
	Alternative D	0.74	25.7	D	1.70	>300	F	
	Alternative F	0.74	27.1	D	1.79	>300	F	
#10 - N High/Folsom/Franklin Sts.	No-Build	0.20	21.8	C	0.55	82.0	F	NB all is critical
(Critical Movement varies between NB and SB)	Alternative A		n/a/			n/a/		Signalized
	Alternative B	0.94	96.5	F	3.00+	>300*	F	NB all is critical
	Alternative C	1.35	219.6	F	3.31	>300*	F	SB all is critical
	Alternative D	0.22	10.9	B	1.21	160.2	F	
	Alternative F	0.36	31.7	D	2.31	>300	F	NB critical in AM, SB critical in PM
#12 -Tsienneto Rd/Pinkerton St	No-Build	0.25	16.1	C	0.97	84.0	F	
(Critical Movement - NW LT)	Alternative A		n/a/			n/a/		Signalized
	Alternative B	0.89	80.0	F	1.00	126.4	F	
	Alternative C	2.04	>300*	F	2.54	>300*	F	
	Alternative D		n/a/			n/a/		Signalized
	Alternative F	0.65	66.1	F	4.10	>300	F	
#15 - NH 28/Scobie Pond Rd	No-Build	1.01	144.7	F	0.58	32.2	D	
(Critical Movement - SB all)	Alternative A	0.18	14.4	B	0.19	16.4	C	
	Alternative B	0.18	13.3	B	0.23	16.5	C	
	Alternative C	0.67	>300*	F	4.44	>300*	F	
	Alternative D	1.34	>300*	F	6.67	4259.8*	F	
	Alternative F	0.31	27.4	D	0.47	51.0	F	
#16 - NH 102/NH Byp 28/E Derry Rd	No-Build	0.87	31.9	D	1.26	151.2	F	
(Traffic Circle-RT only)	Alternative A	1.11	94.0	F	0.92	41.9	E	
(HCM 2010)	Alternative B	0.77	21.4	C	0.68	16.4	C	
(Critical Movement - E Derry Rd)	Alternative C	0.73	18.8	C	0.78	21.7	C	
	Alternative D	0.84	28.3	D	0.89	33.6	D	
	Alternative F	0.91	40.1	E	1.21	128.7	F	
#17 - NH Byp 28/Pinkerton/Nesmith	No-Build	-	-	F	-	-	F	Left turns from Nesmith
(HCM 2010)	Alternative A	1.01	138.9	F	0.52	55.3	F	
(Critical Movement - WB all)	Alternative B	1.13	188.1	F	0.53	57.3	F	
	Alternative C	0.96	127.6	F	0.41	41.7	E	
	Alternative D	1.35	280.7	F	0.63	78.3	F	
	Alternative F	0.45	26.2	D	0.46	49.1	E	
#24 - B/C Connector Rd/Tsienneto Road	No-Build		n/a/			n/a/	-	Does not exist
(Critical Movement - NB LT)	Alternative A		n/a/			n/a/	-	Does not exist
	Alternative B	0.09	38.9	E	0.00	0.0	A	
	Alternative C	0.00	0.0	A	0.00	0.0	A	
	Alternative D		n/a/			n/a/	-	Does not exist
	Alternative F		n/a/			n/a/		Does not exist

Table 12 (Cont'd)
Summary of 2040 Capacity Analyses by Alternative

Unsignalized Intersections

Intersection	2040 Alternative	AM Peak Hour v/c ratio	AM Peak Hour Average Delay	AM Peak Hour LOS	PM Peak Hour v/c ratio	PM Peak Hour Average Delay	PM Peak Hour LOS	Comments/ Lane Use Revisions
#27 - NH 102/English Range Road	No-Build		n/a/			n/a/	-	
(Critical Movement - SEB all)	Alternative A	0.17	20.8	C	0.16	28.4	D	
	Alternative B	0.23	24.5	C	0.22	26.1	D	
	Alternative C	0.17	20.8	C	0.23	42.1	E	
	Alternative D	0.17	21.0	C	0.18	32.8	D	
	Alternative F	0.17	20.8	C	0.16	28.4	D	

* - calculated delay exceeds 300s

17. Findings and Conclusions

The results of the traffic modeling for the Project indicates that the provision of a new interchange on I-93 will provide varying levels of traffic relief to NH Route 102 east of Exit 4 and into the downtown Derry area by the 2040 design year, as shown in Table 7.

Examples on key links include:

- NH Route 102 east of Exit 4: In the 2040 No-Build case, there is projected to be 41,725 vpd on this segment. Alternative A provides the most relief on this segment (-51.5%) to a volume of 20,240 vpd, which is the same magnitude as the 2015 base volume. Alternative B shows a 48% reduction, while Alternatives C and D show lesser reductions. Alternative F shows a slight increase in projected traffic than any interchange alternative.
- NH Route 102 east of Griffin Street (downtown): Alternatives A, B and C show similar reductions, on the order of 19-21%, or 3000-4000 vpd, over 2040 No-Build conditions. Alternative D shows a lesser reduction, but still lower volume than the 2015 base. Alternative F projects higher volumes than any interchange alternative and would be higher than either the 2015 or 2040 No-Build case.
- Volumes on the Exit 4 ramps are lower under most interchange alternatives, with Alternative A providing the most overall relief over No-Build conditions, even under the highest potential development scenario for the Woodmont Commons development.
- Volumes on the Exit 5 ramps see the highest traffic reductions under Alternatives C and D (northerly interchange) than under a southerly interchange scenario.

Mainline freeway facilities operational analyses indicates that the four-lane I-93 mainline will function at an acceptable LOS C or better under all scenarios, with a couple of exceptions where two-lane on- or off-ramps may be needed to accommodate all projected volumes. A sensitivity analyses of the Exit 4A SB off-ramp indicated that a 200-vph reduction in the assigned traffic would allow this ramp to function as a single lane off-ramp if these traffic projections are not fully realized.

The Exit 4 ramps would have slightly higher volumes under either Alternatives A or B, but this is more reflective of the higher potential development scenario assumed for the Woodmont Commons development than for Alternatives C, D or F, which use the same scenario as the No-Build condition. As noted earlier, should the 23% internal capture rate for Woodmont Commons trips be realized in some form, the number of trips assigned to the study area network may be reduced accordingly, which should result in better traffic operations than the worse-case scenario assumed in this study.

The level of intersection improvements needed to accommodate the alternative and connector road corridors vary greatly depending on alternative. In general, all intersections can provide an acceptable LOS under any alternative with appropriate lane use and signalization/coordination as required. The traffic circle at NH Route 102/NH Route 28 Bypass will continue to function at a poor LOS regardless of alternative.

In summary, from a purely traffic standpoint, Alternatives A appears to best satisfy the Purpose and Need for the Project by providing the greatest reductions in NH Route 102 traffic through downtown Derry than the other alternatives evaluated. Volumes on NH Route 102 just east of Exit 4 would be roughly half of 2040 No-Build levels and similar to existing (2015) conditions. Alternative B provides some relief as well, but primarily serves a north-south trip pattern as opposed to the east-west pattern needed to reduce traffic on NH 102 in downtown Derry. Alternatives C and D would provide some, but not as much, relief to the NH Route 102 corridor, because of the increased distance between these northerly interchange alternatives and the NH Route 102 corridor.

Other natural and cultural resource impact criteria will be used to provide the final assessment of the Preferred Alternative, but the previous finding of Alternative A as the Preferred Alternative from a traffic standpoint is supported by the updated analyses contained herein.

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I-93 Exit 4A Supplemental Draft EIS

Alternatives

- A
- B
- C
- D
- F

Major Roads

- Interstate
- Principal Arterial
- Minor Arterial
- Major Collector
- Minor Collector
- Local Road
- Town Boundaries

0 750 1,500 3,000 Feet

Coordinate System:
NAD 1983 StatePlane
New Hampshire (feet)

Date:
September 27, 2016

New Hampshire DOT
Department of Transportation

Sources:
CLD Engineers
Town of Derry GIS
Town of Londonderry GIS
New Hampshire DOT

Figure 1 - I-93 Exit 4A Supplemental Draft EIS - Alternative

I-93 Exit 4A
Supplemental Draft EIS

TRAFFIC COUNT LOCATIONS

INDEX

- ATR Location (See Table 7)
- Intersections
- Town Boundry
- Roads

Feet
0 1,000 2,000

Sources:

Coordinate System:
NAD 1983 StatePlane
New Hampshire (feet)

Date:
September 27, 2018

New Hampshire DOT
Department of Transportation

Figure 2 - Traffic Count Locations

I-93 Exit 4A
Supplemental Draft EIS

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1. Exit 4 SB Ramps
2. Exit 4 NB Ramps
3. Exit 5 SB Ramps
4. Exit 5 NB Ramps
5. NH 102/ Londonderry Road
6. NH 102/ Fordway/ High St.
7. NH 102/ NH 28
8. N. High St./ Ash St. Extension
9. N. High St./ Madden Rd.
10. N. High St./ Folsom Rd./ Franklin St
11. NH 28/ Folsom Rd./ Tsienneto Rd.
12. Tsienneto Rd./ Pinkerton St.
13. NH 28/ Linlew Dr.
14. NH28/ Ashleigh Dr.
15. NH 28/ Scobie Pond Rd.
16. NH 102/ NH 28 Bypass/ E. Derry Rd.
17. NH 28 Bypass/ Pinkerton St.
18. NH 28 Bypass/ Tsienneto Rd.
19. NH 102/ Tsienneto Rd.
20. Exit 4A SB Ramps
21. Exit 4A NB Ramps
22. NH 28/ B-C Connector
23. NH 28 Bypass/ B-C Connector
24. Tsienneto Rd/ B-C Connector
25. NH 28/ C-D Connector
26. NH 102/ North Shore Rd
27. NH 102/ English Range Rd

Feet
0 1,000 2,000

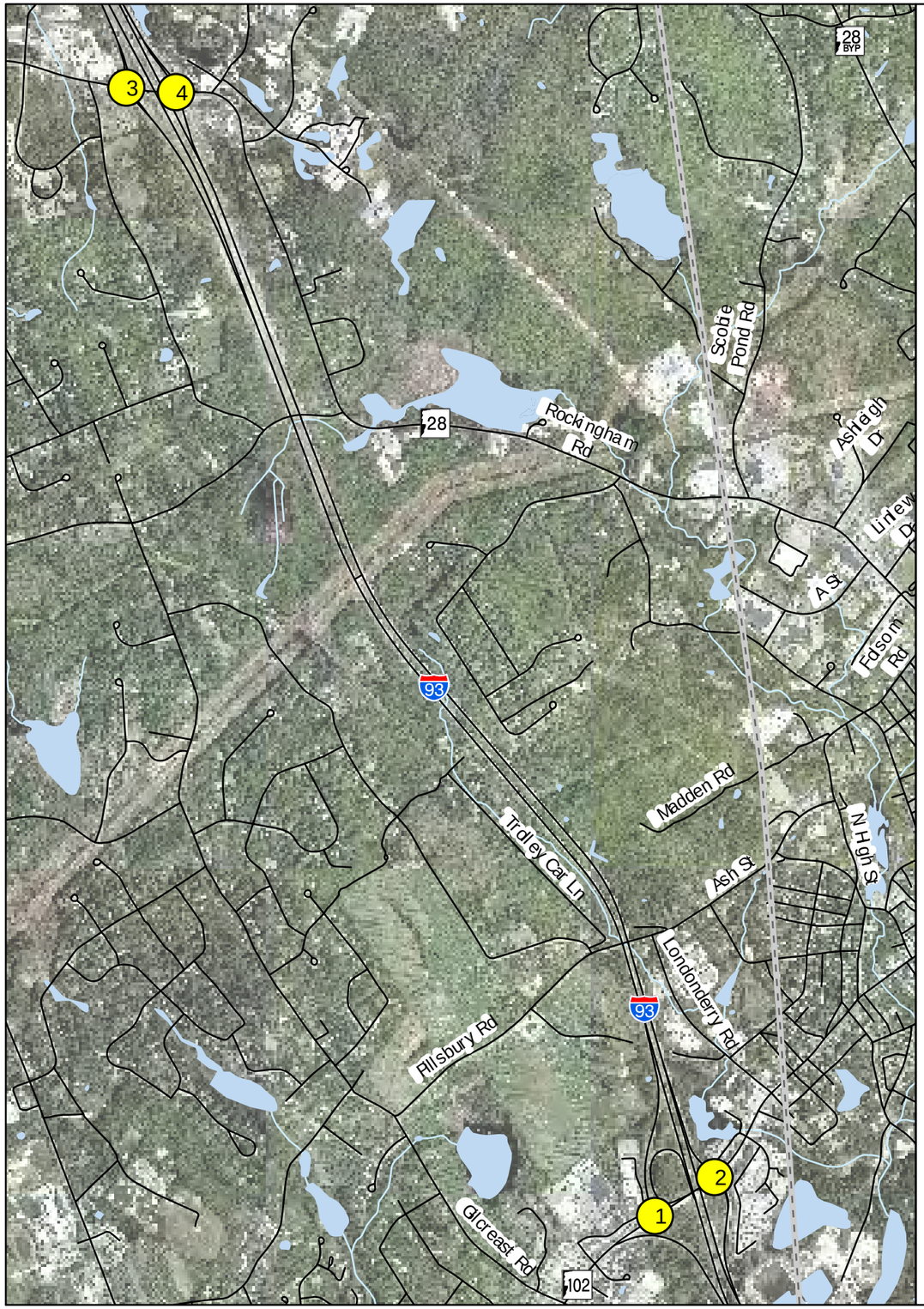
Sources:

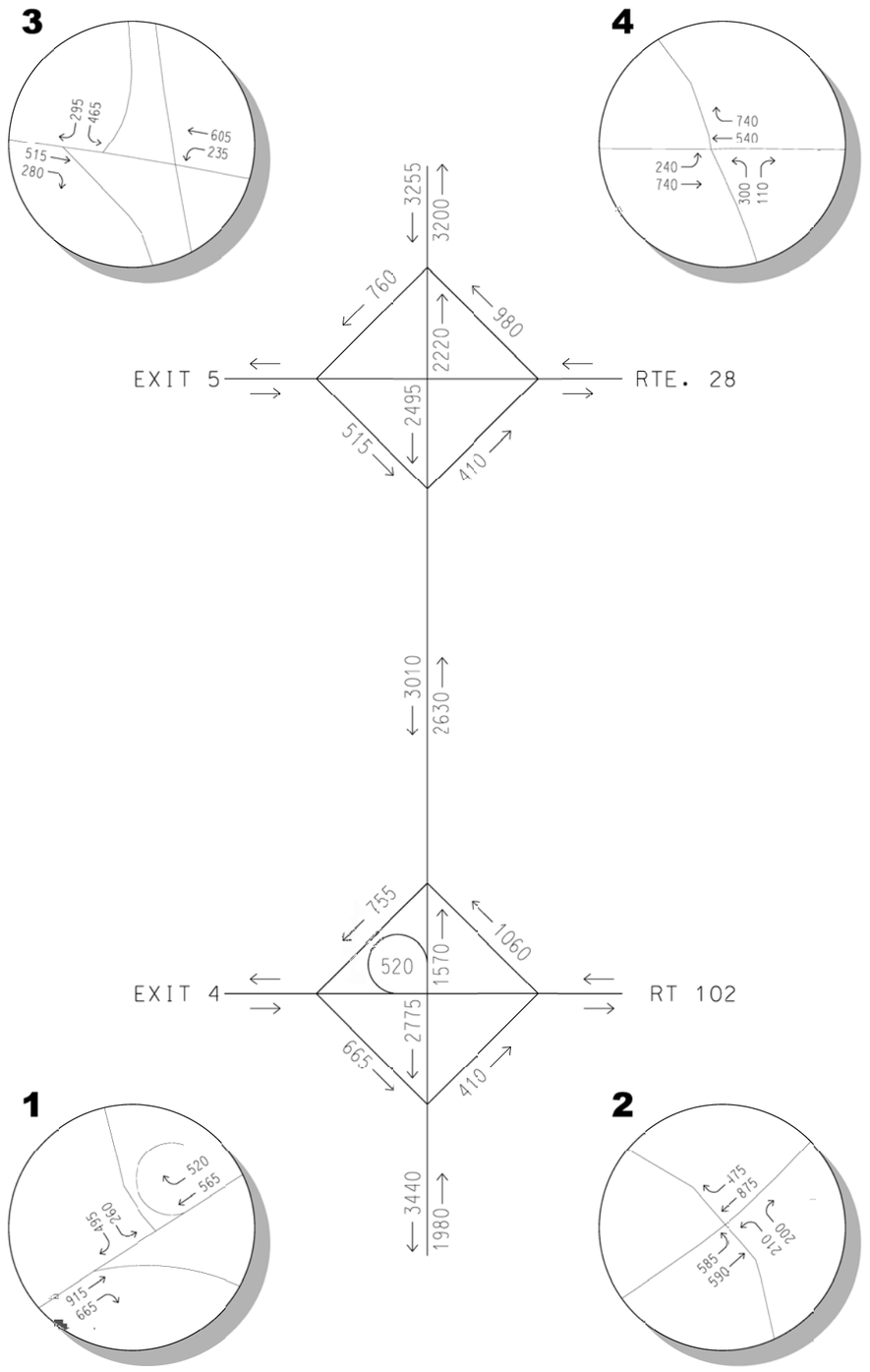
Coordinate System:
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 3 - I-93 Exit 4A Supplemental Draft EIS – Zones 1-6 Locus Map





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2015 NO-BUILD AM PEAK HOUR BASE VOLUMES

INDEX

1. Exit 4 SB Ramps
2. Exit 4 NB Ramps
3. Exit 5 SB Ramps
4. Exit 5 NB Ramps

Feet
0 1,000 2,000

Sources:

Coordinate System
NAD 1983 StatePlane
New Hampshire (feet)

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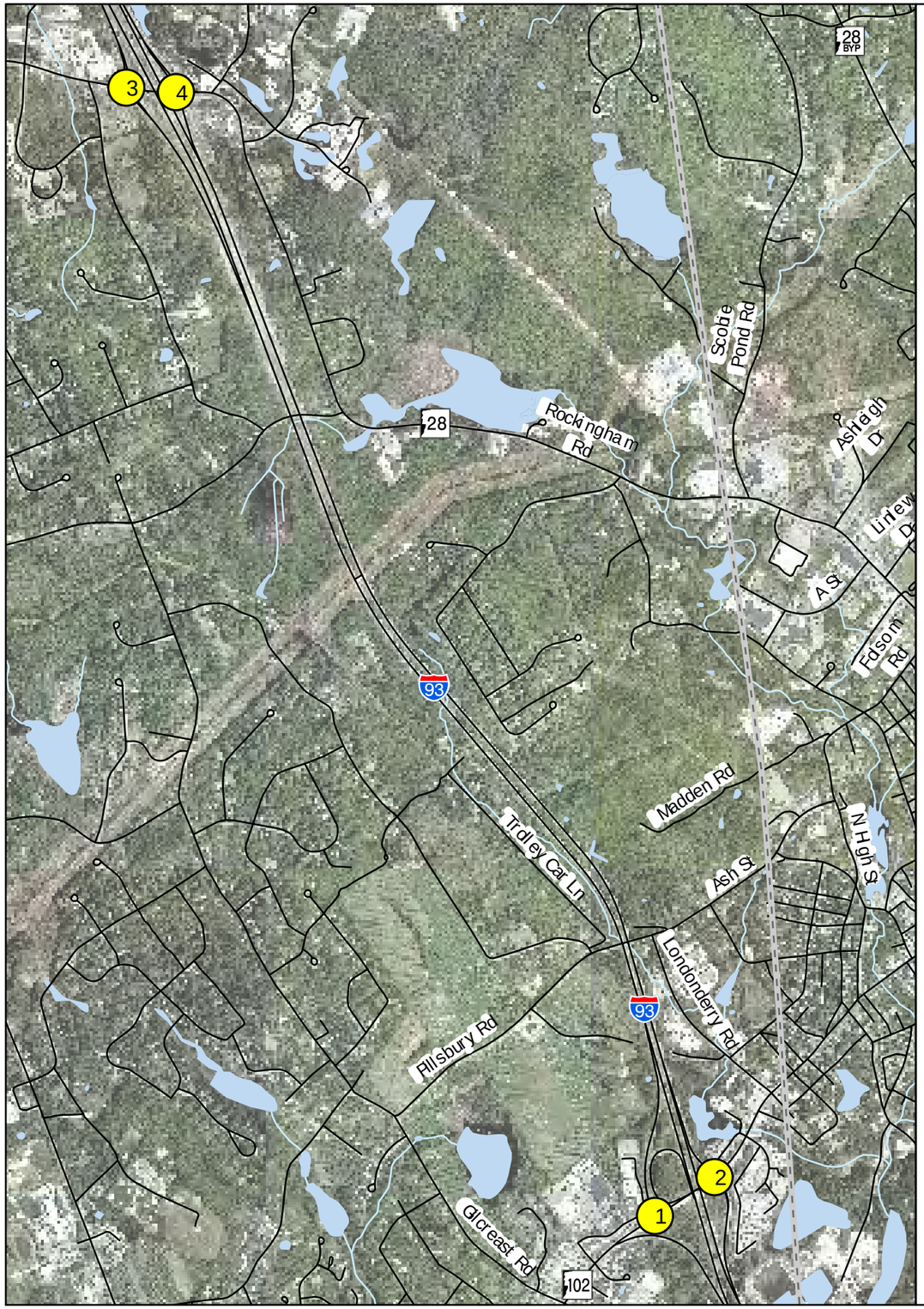
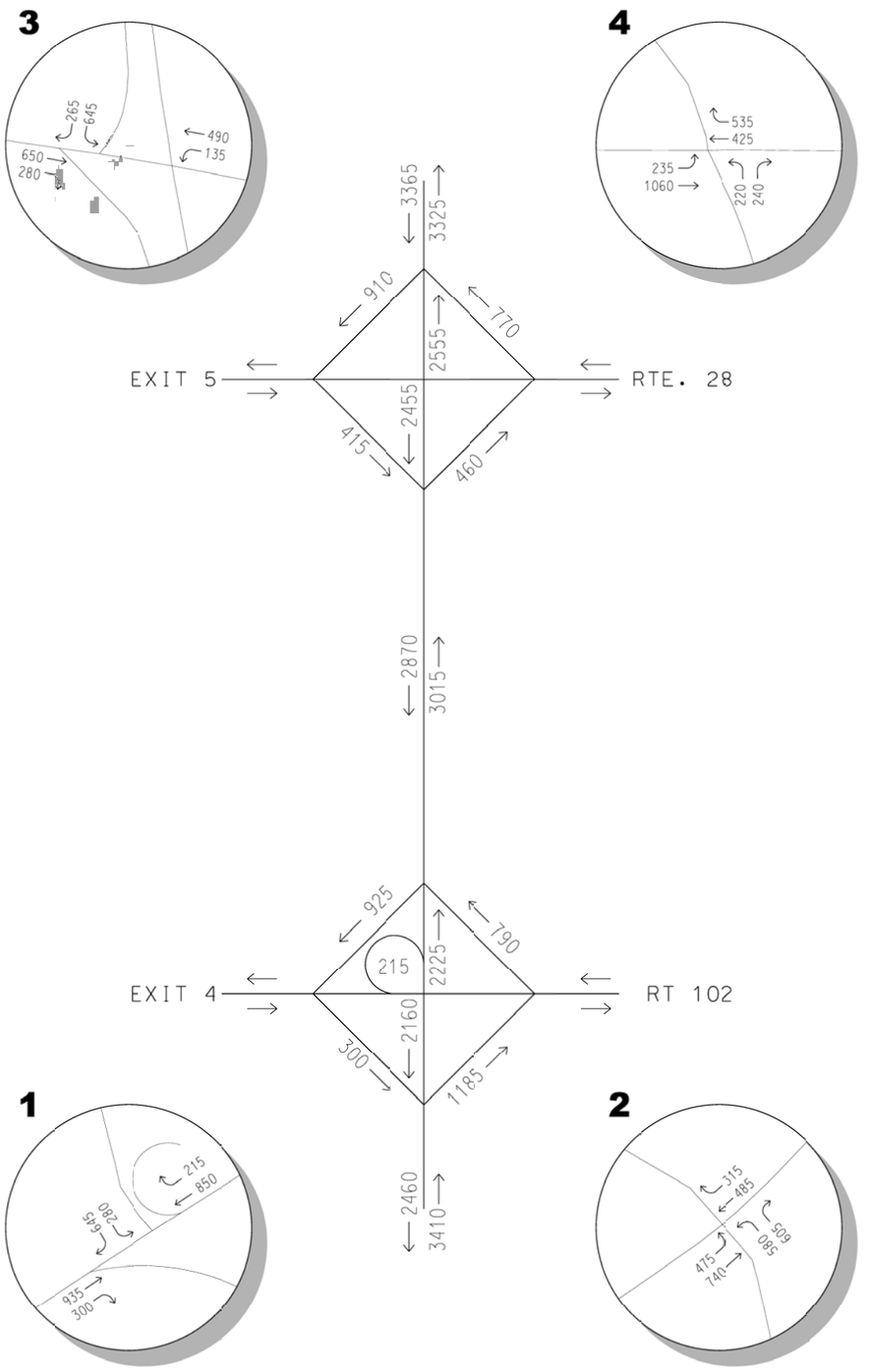
New Hampshire DOT
Department of Transportation

Figure 4 - 2015 No-Build AM Peak Hour Base Volumes - Locations 1-4





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2015 NO-BUILD PM PEAK HOUR BASE VOLUMES

INDEX

1. Exit 4 SB Ramps
2. Exit 4 NB Ramps
3. Exit 5 SB Ramps
4. Exit 5 NB Ramps

Feet
0 1,000 2,000

Sources:

Coordinate System
NAD 1983 StatePlane
New Hampshire (feet)

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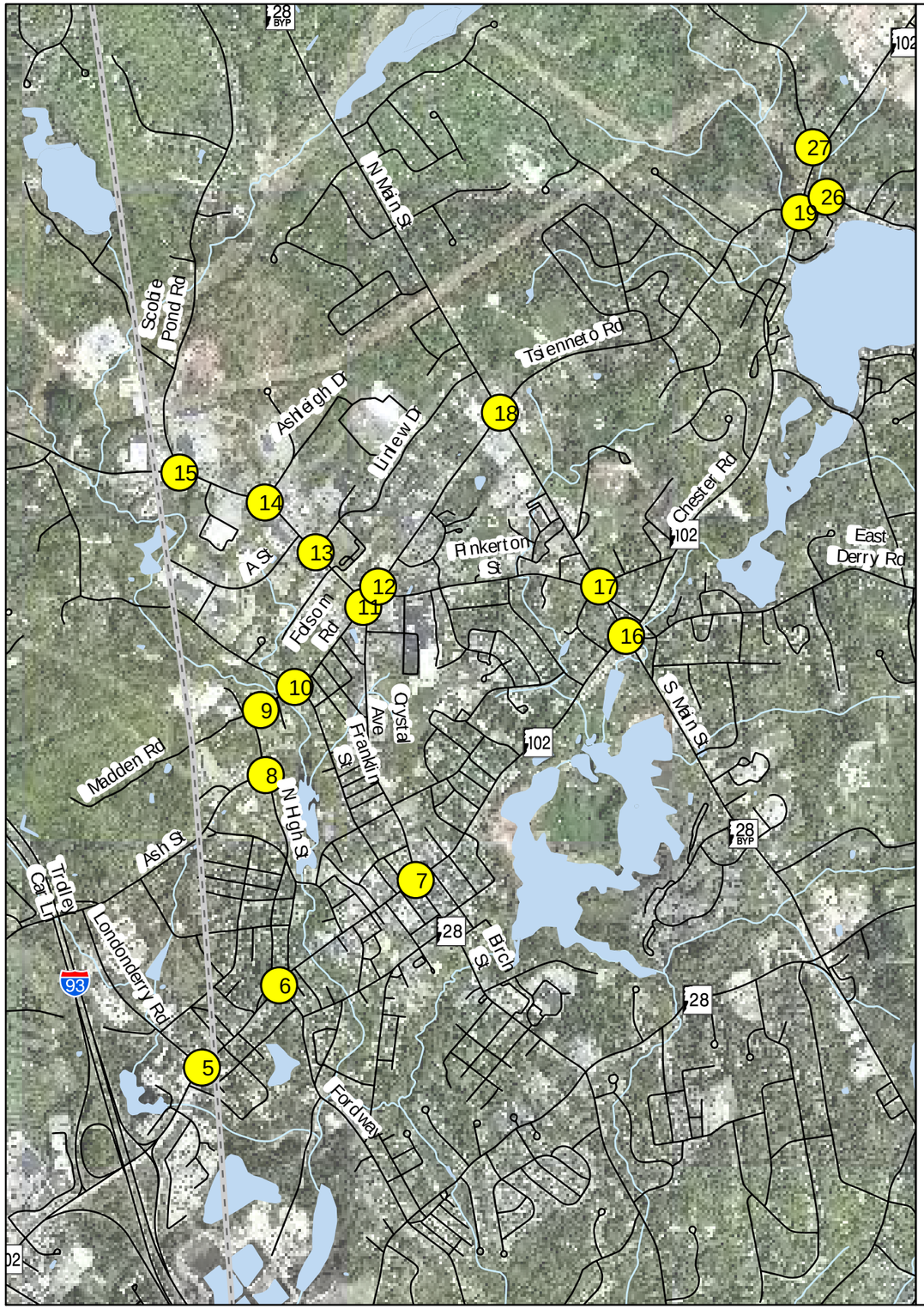
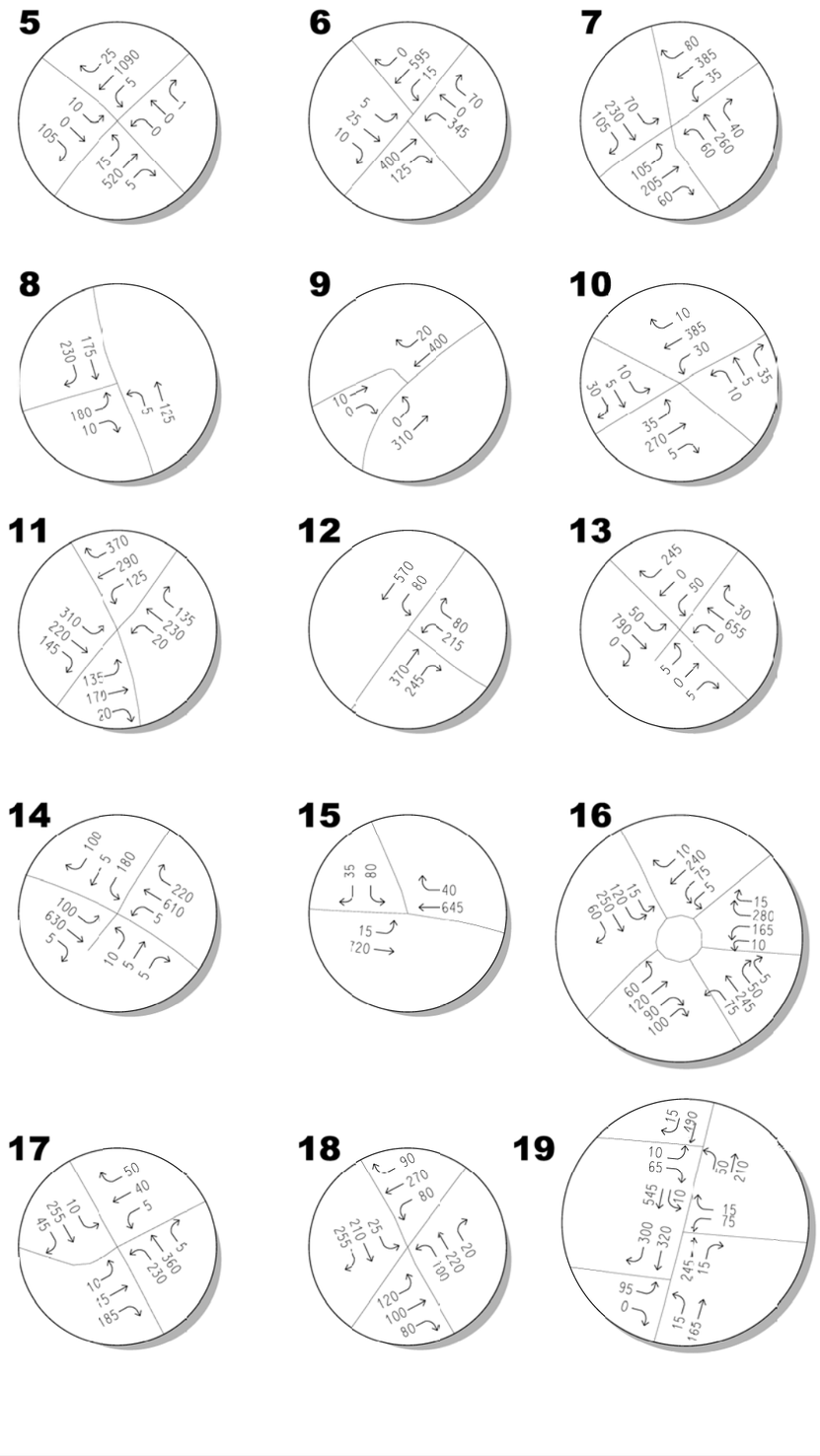
Figure 5 - 2015 No-Build PM Peak Hour Base Volumes – Locations 1-4





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2015 NO-BUILD AM PEAK HOUR BASE VOLUMES

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7. NH 102/ NH 28
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10. N High St./ Fdsom Rd./ Franklin St.
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12. Tsienneto Rd./ Pinkerton St.
13. NH 28/ Linlew Dr.
14. NH28/ Ashleigh Dr.
15. NH 28/ Scobie Pond Rd.
16. NH 102/ NH 28 Bypass/ E. Derry Rd.
17. NH 28 Bypass/ Pinkerton St.
18. NH 28 Bypass/ Tsienneto Rd.
19. NH 102/ Tsienneto Rd.
26. NH 102/ North Shore Rd
27. NH 102/ English Range Rd

Feet
0 1,000 2,000

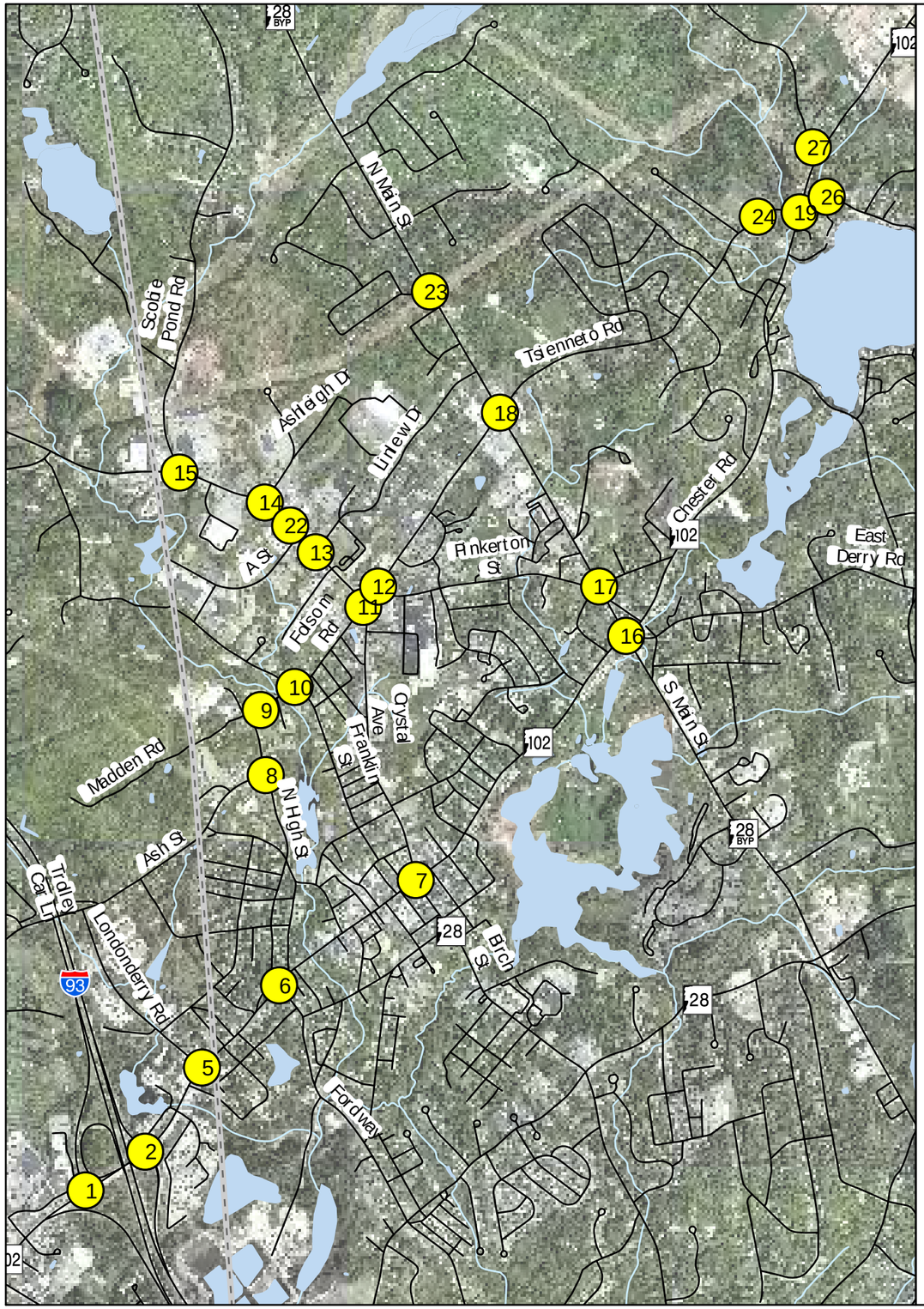
Sources:

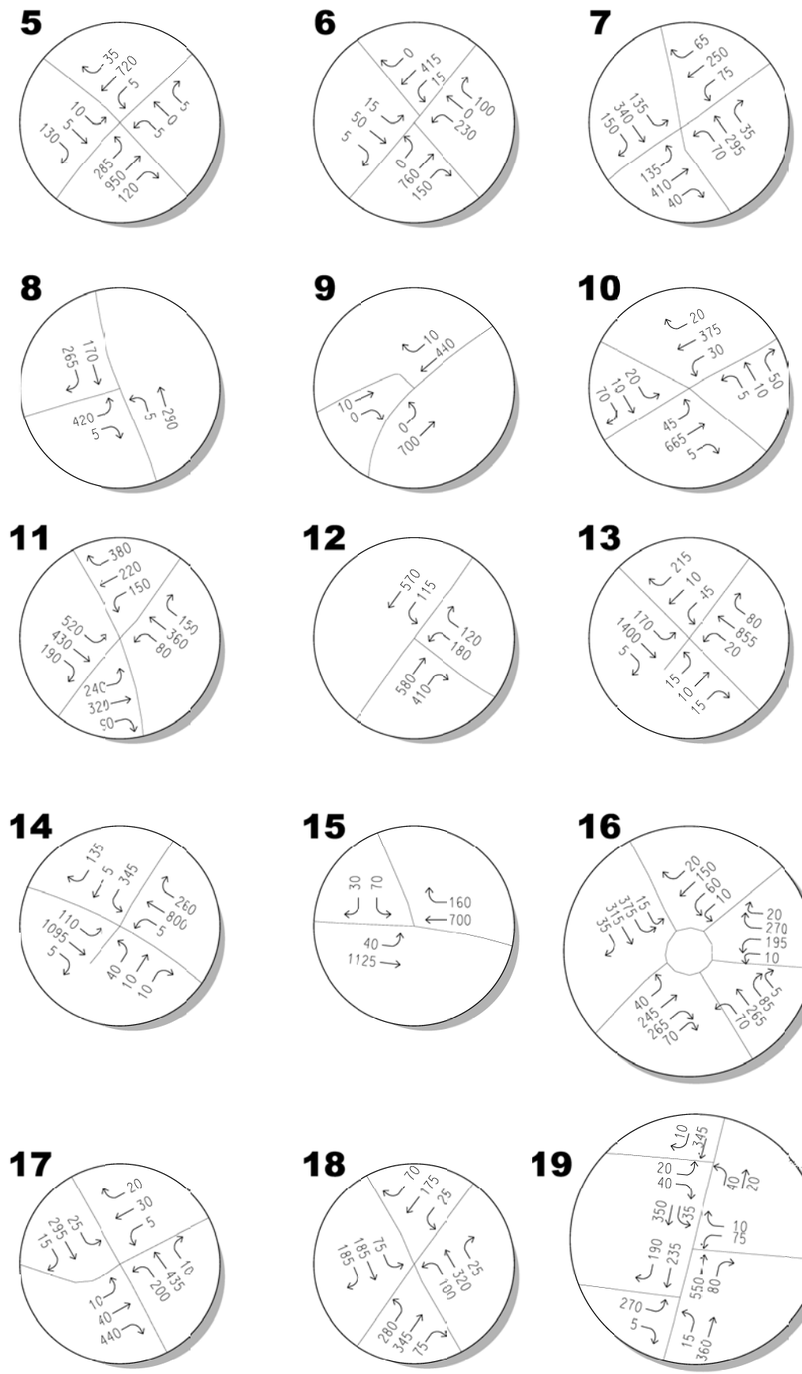
Coordinate System:
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 6 - 2015 No-Build AM Peak Hour Base Volumes - Locations 5-19 and 26-27





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2015 NO-BUILD PM PEAK HOUR BASE VOLUMES

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5. NH 102/ Londonderry Road
6. NH 102/ Fordway/ High St.
7. NH 102/ NH 28
8. N. High St./ Ash St. Extension
9. N. High St./ Madden Rd.
10. N. High St./ Folsom Rd./ Franklin St.
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12. Tsienneto Rd./ Pinkerton St.
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14. NH28/ Ashleigh Dr.
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18. NH 28 Bypass/ Tsienneto Rd.
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26. NH 102/ North Shore Rd.
27. NH 102/ English Range Rd.

Feet
0 1,000 2,000

Sources:

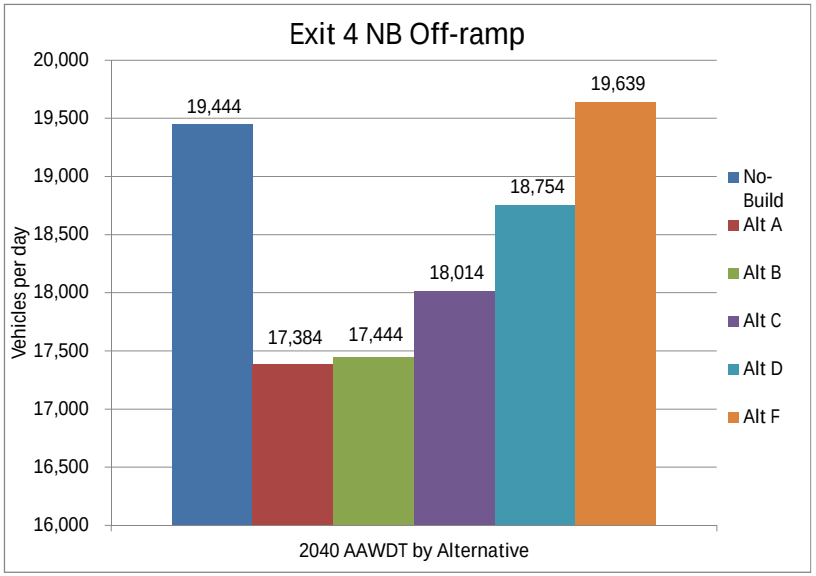
Coordinate System:
NAD 1983 StatePlane
New Hampshire (feet)

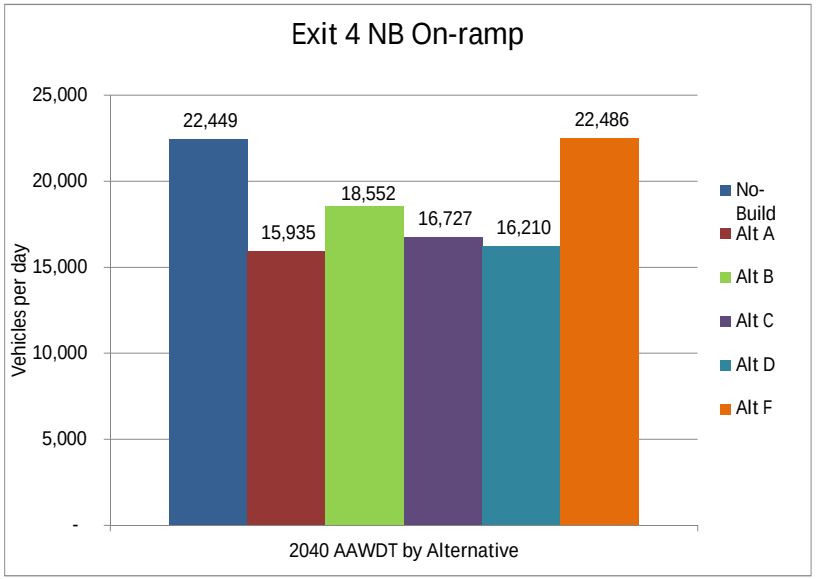
Date:
January 24, 2018

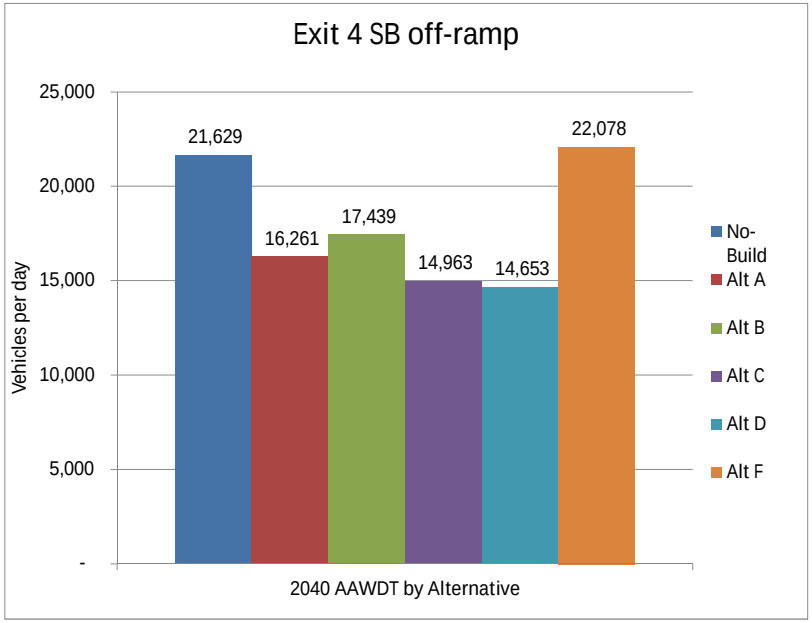
New Hampshire DOT
Department of Transportation

Figure 7 - 2015 No-Build PM Peak Hour Base Volumes – Locations 5-19 and 26-27

FIGURE 8 - VOLUME COMPARISONS - EXIT 4 RAMPS







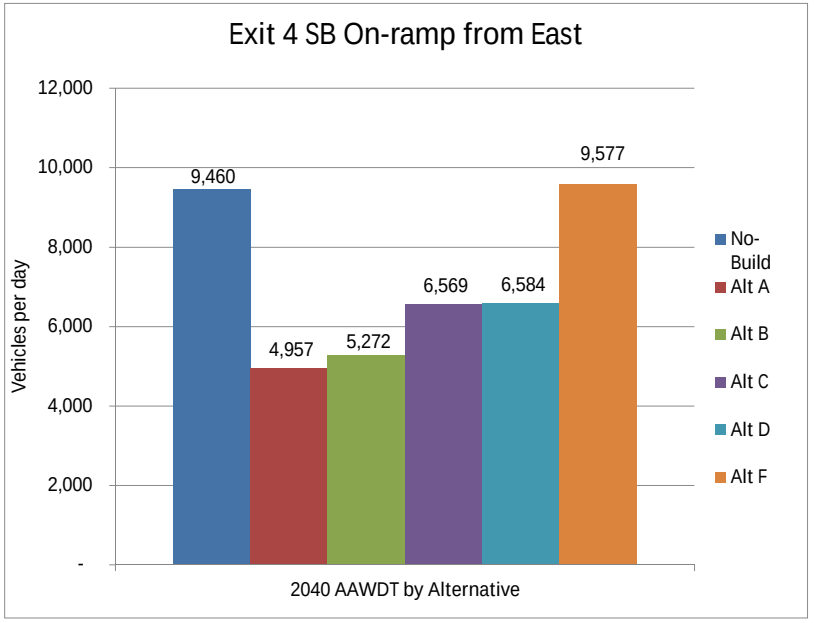
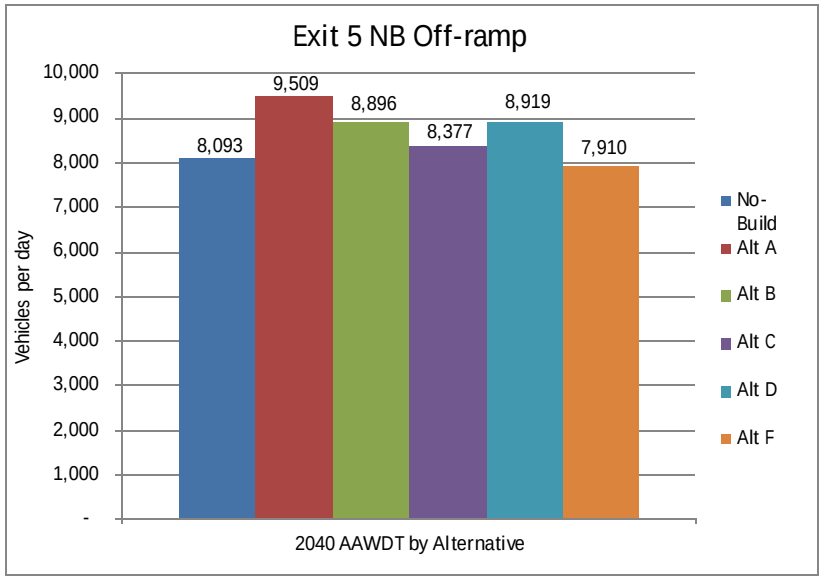
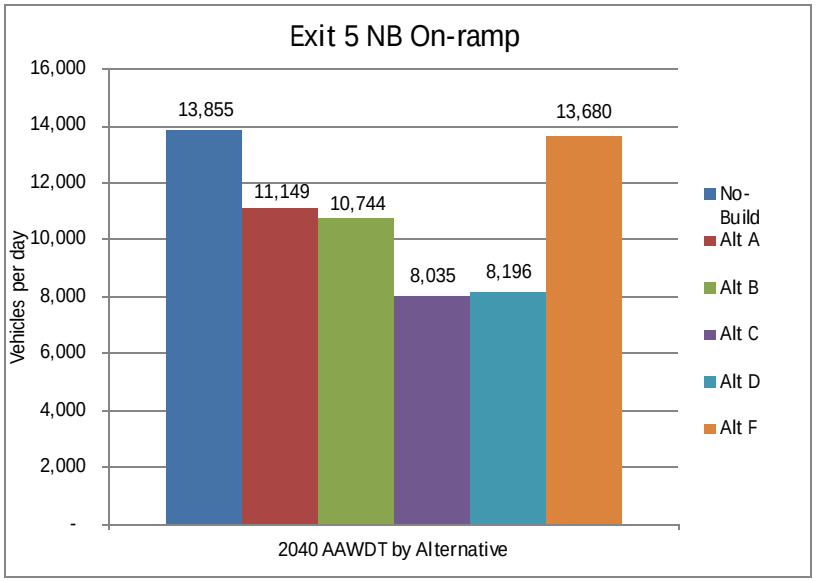
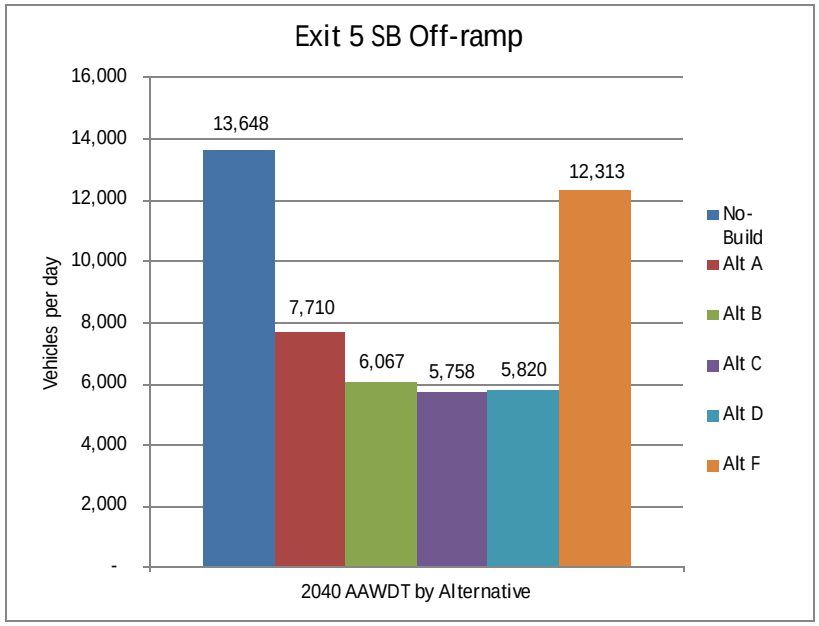


FIGURE 9 - VOLUME COMPARISONS - EXIT 5 RAMPS







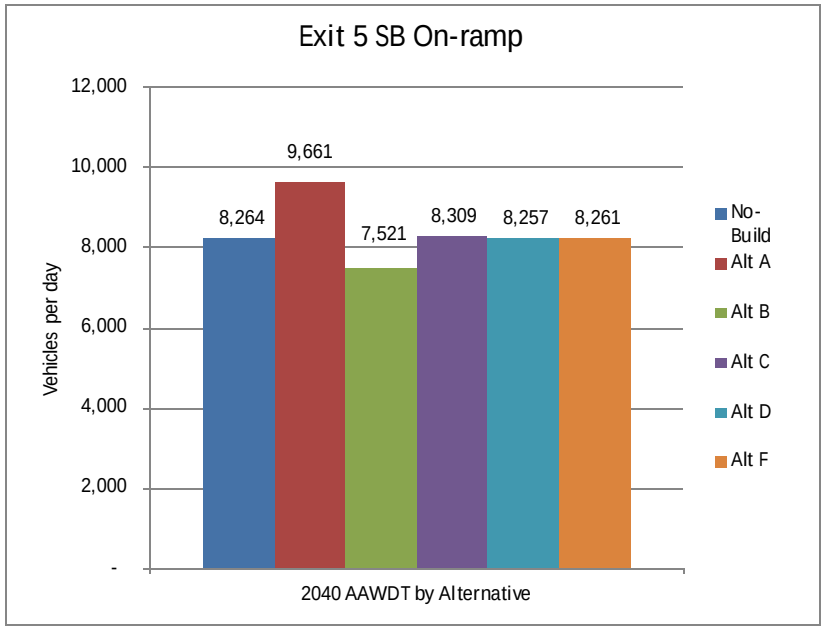
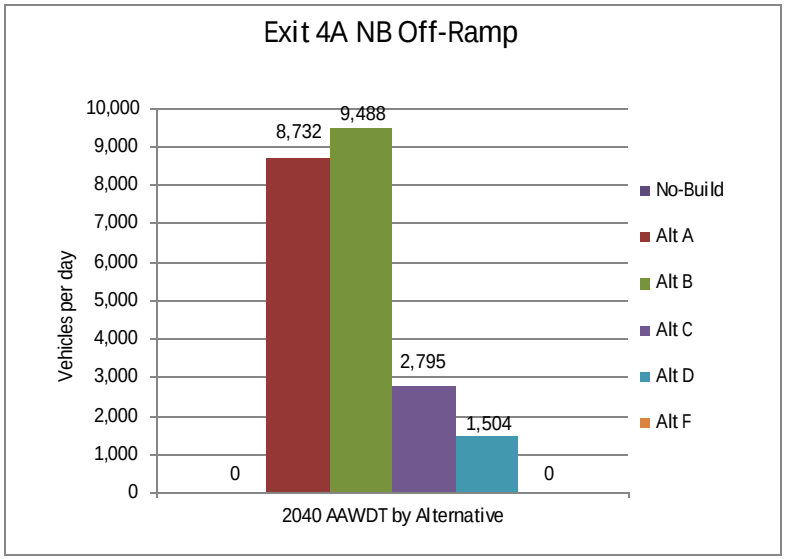
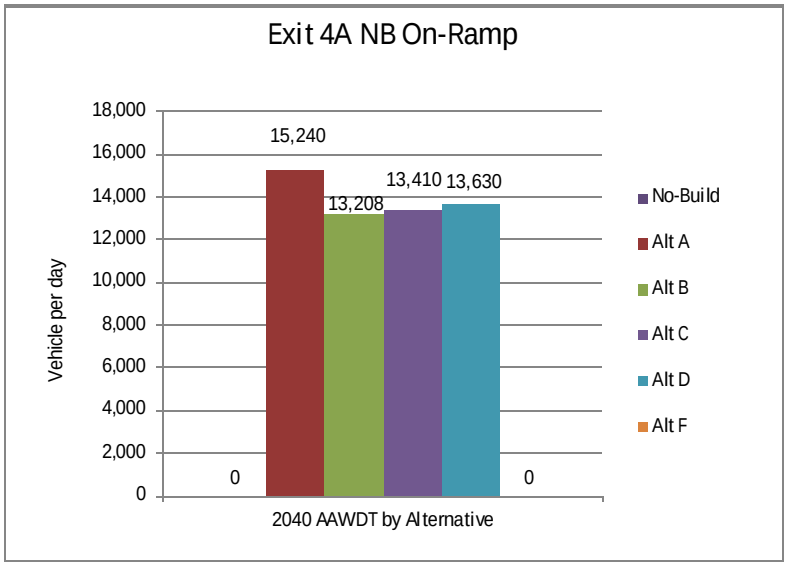
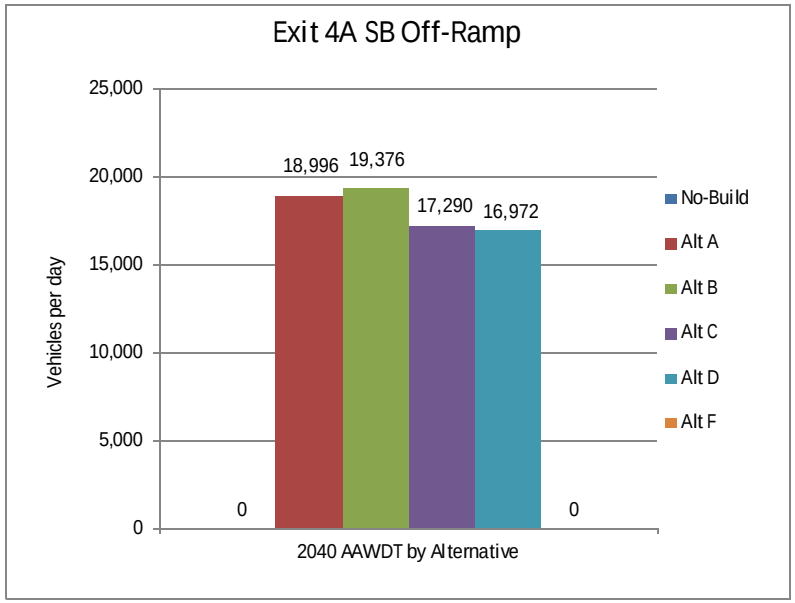


FIGURE 10- VOLUME COMPARISONS - EXIT 4A RAMPS







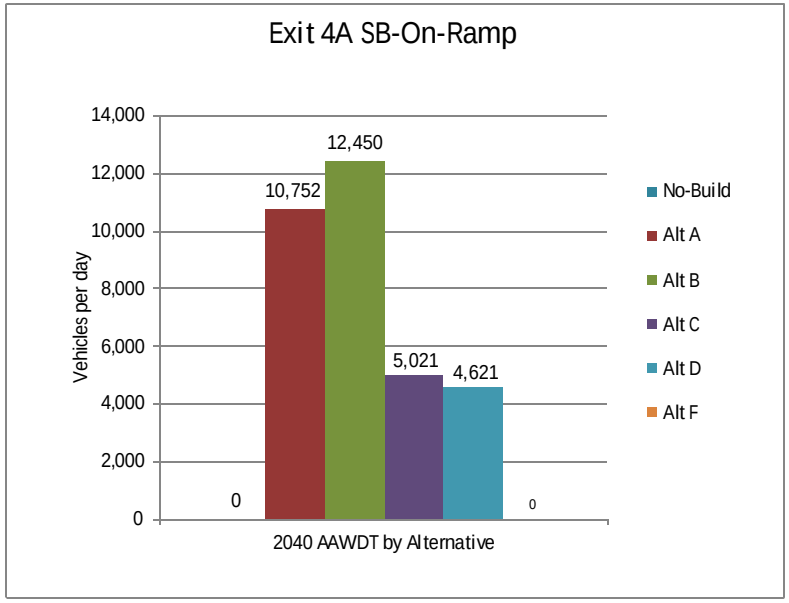
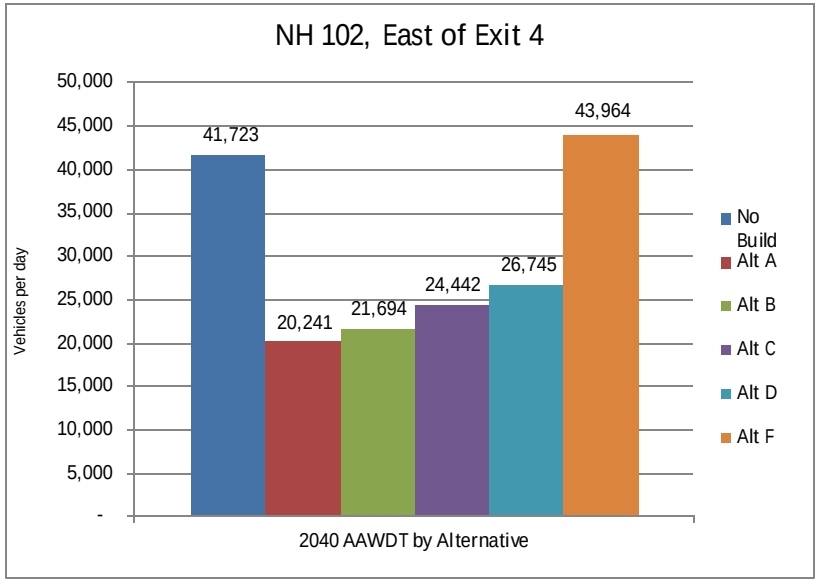
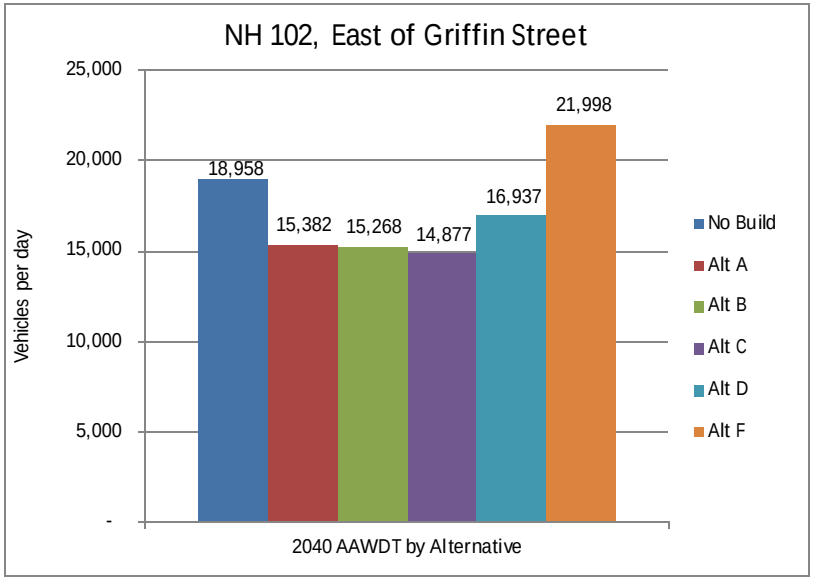
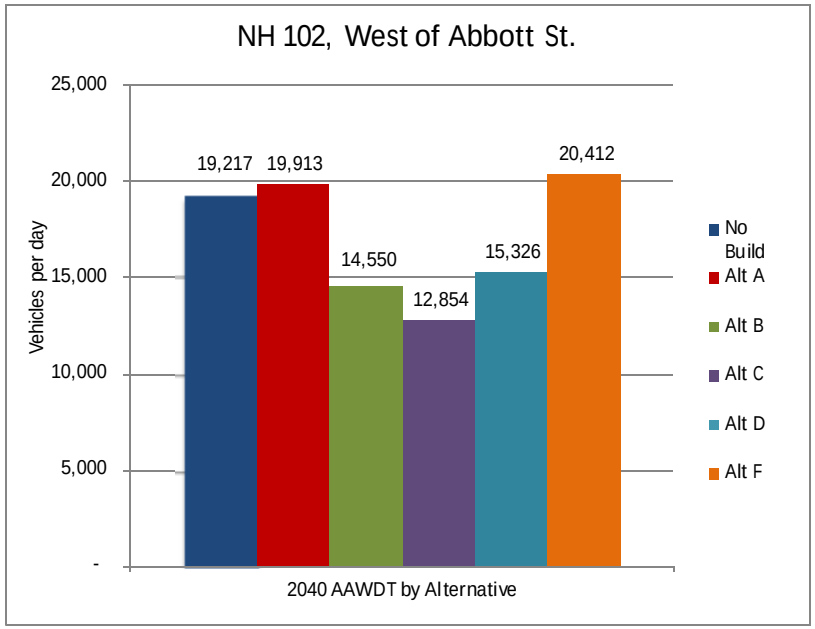


FIGURE 11 - VOLUME COMPARISONS - NH ROUTE 102 CORRIDOR







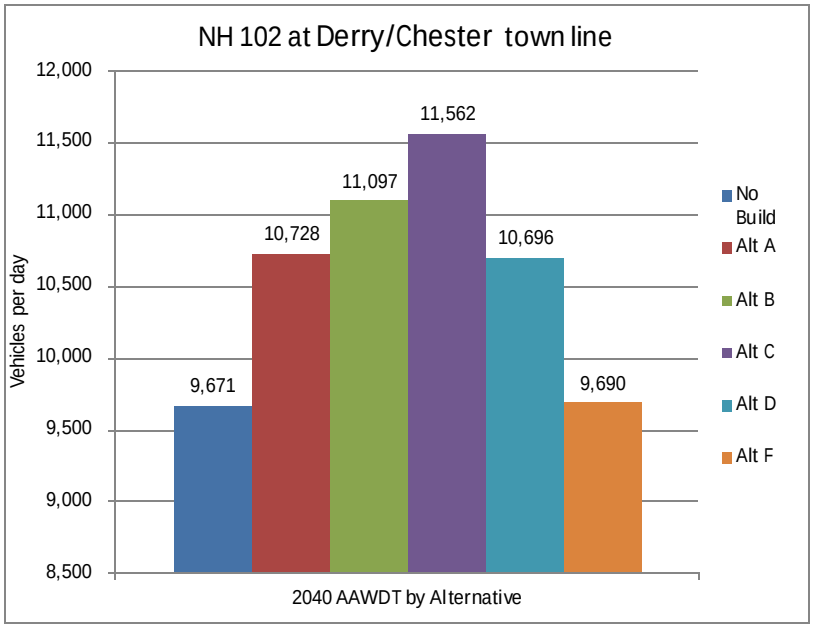
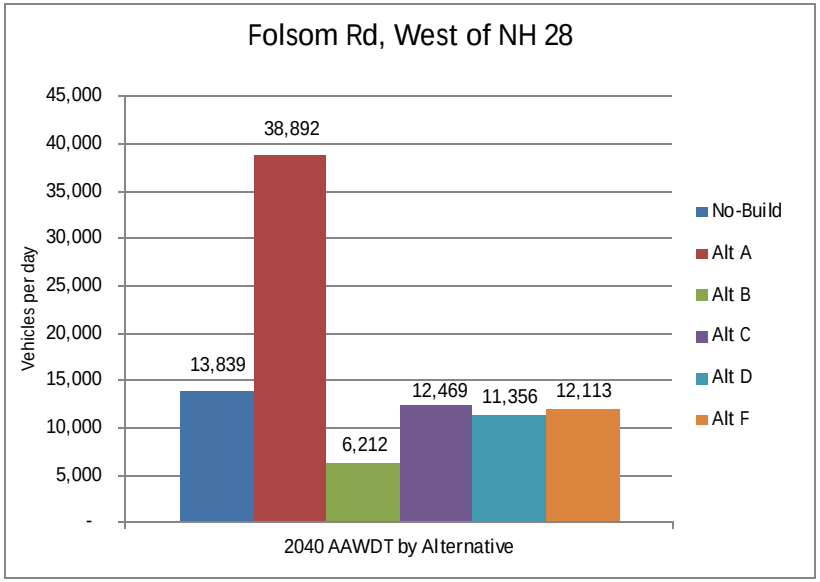
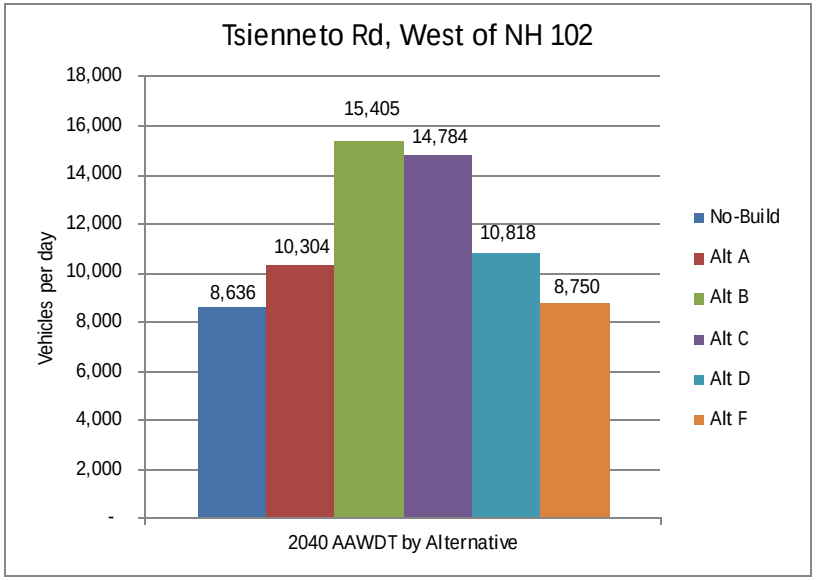
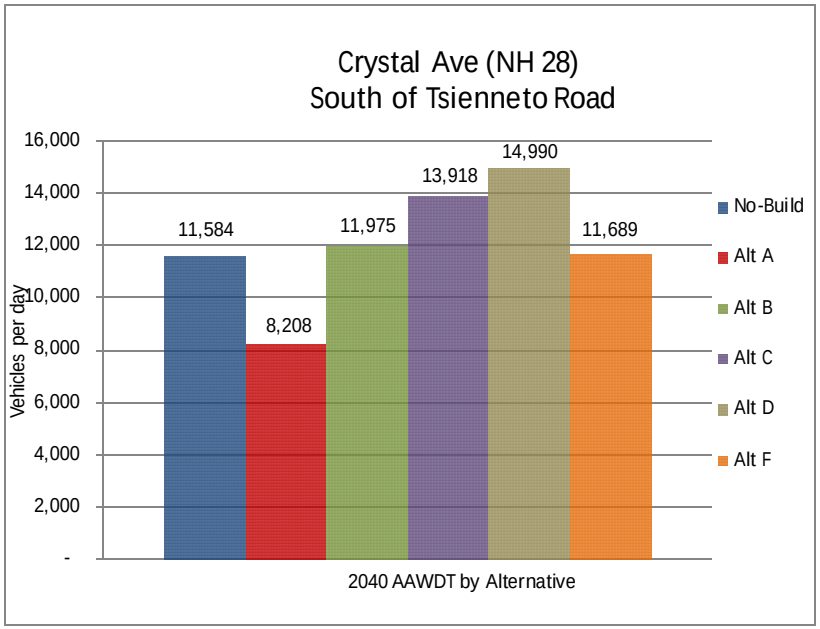
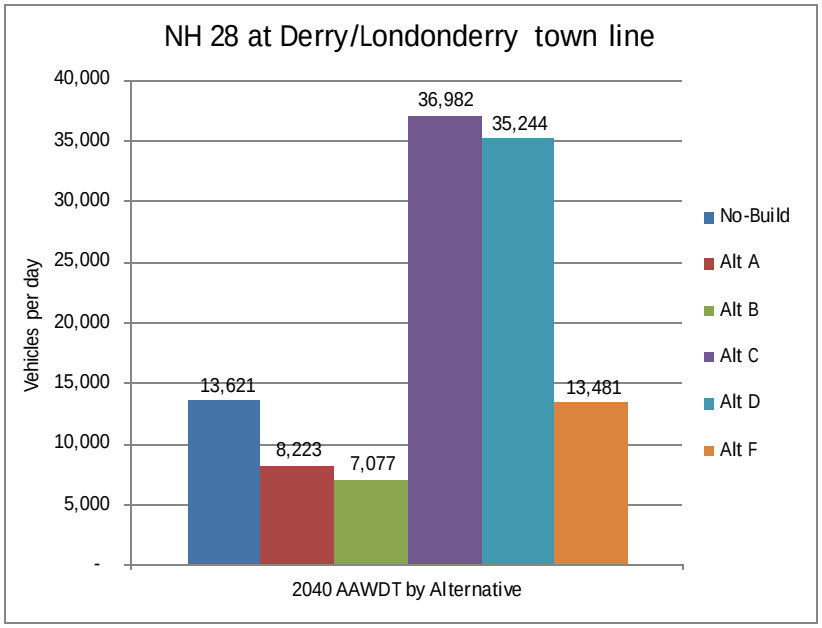


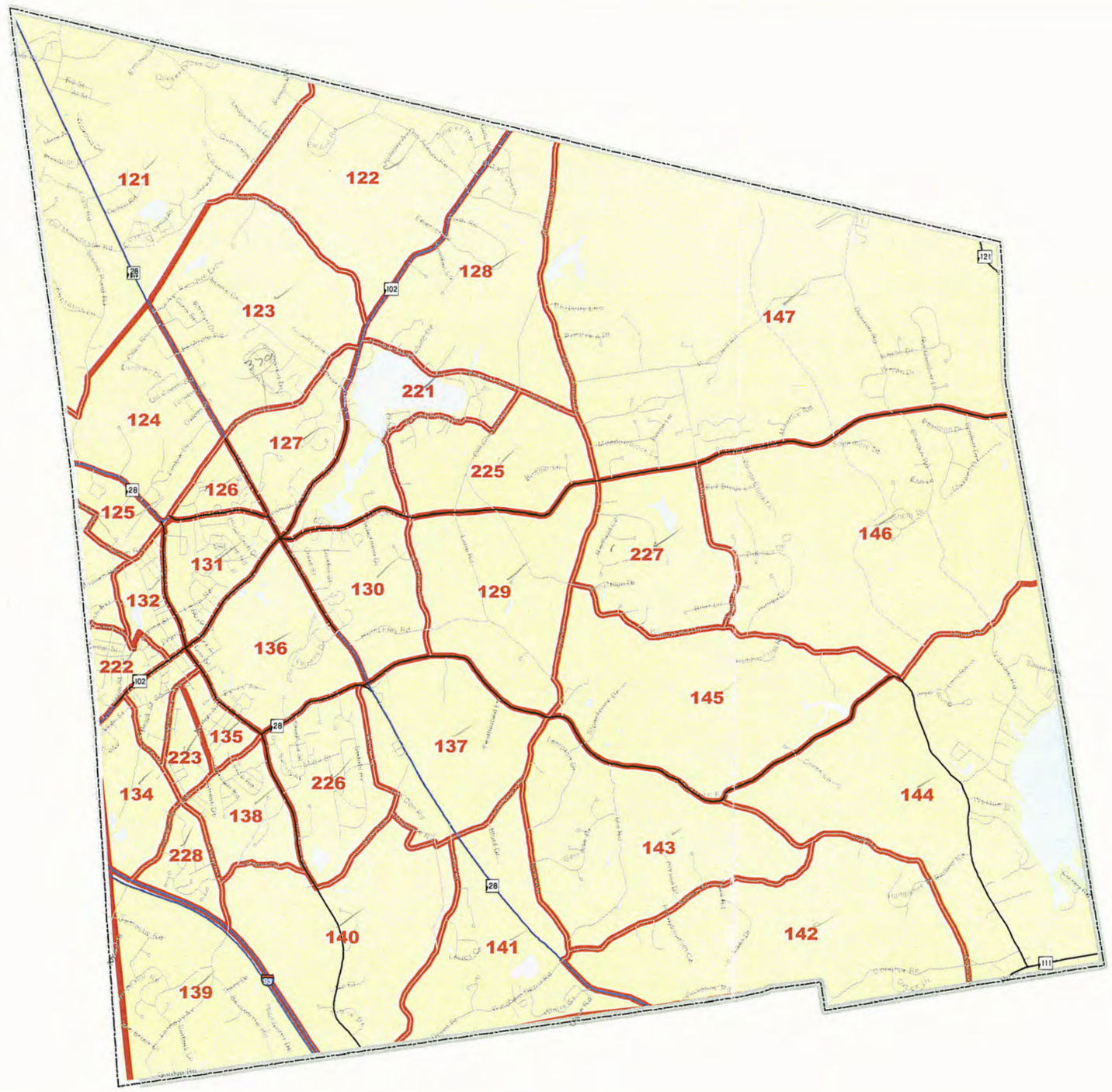
FIGURE 12- VOLUME COMPARISONS- OTHER LOCAL STREETS











2011 Traffic Analysis Zones

Town of Derry

- Traffic Analysis Zones
- Town Boundary
- Streams
- Water

Roads

- Highways
- Major Roads
- Local Roads
- Class VI Roads

N

0 0.35 0.7 1.4 Miles

Data Sources:
Granit Digital Data (1:24,000)
NH Department of Transportation
SNHPC

The individual municipalities represented on this map and the SNHPC make no representations or guarantees to the accuracy of the features and designations of this map.

This map is prepared for planning purposes only and is not to be used for legal boundary determinations or for regulatory purposes.

Map Produced by GIS Service SNHPC 2012
Contact: SNHPC, gis@snhpc.org or (603) 669-4664

Figure 13 - SNHPC Traffic Analysis Zones - Derry NH

Exhibit #8A- Traffic Analysis Zones in the SNHPC Region

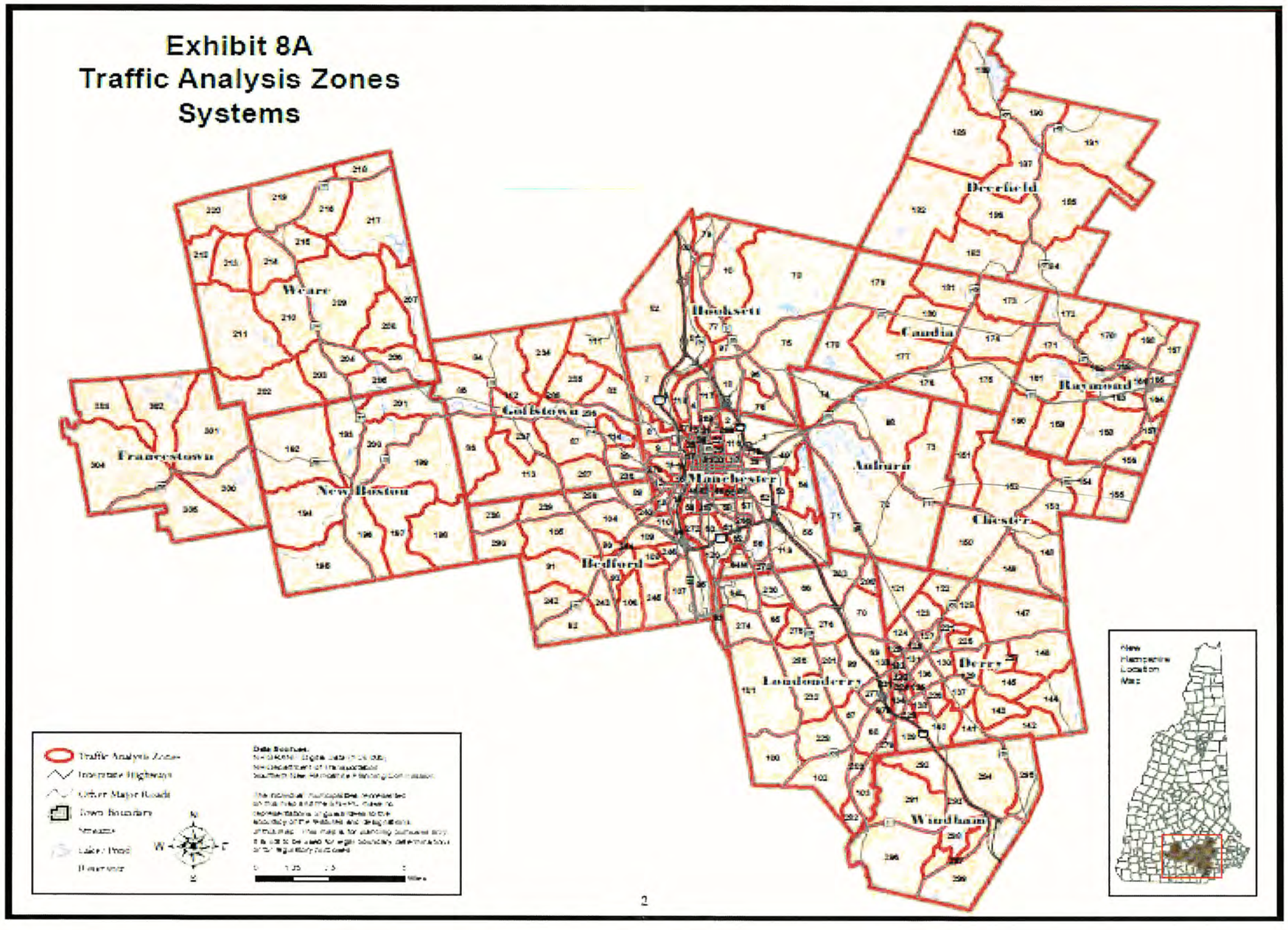
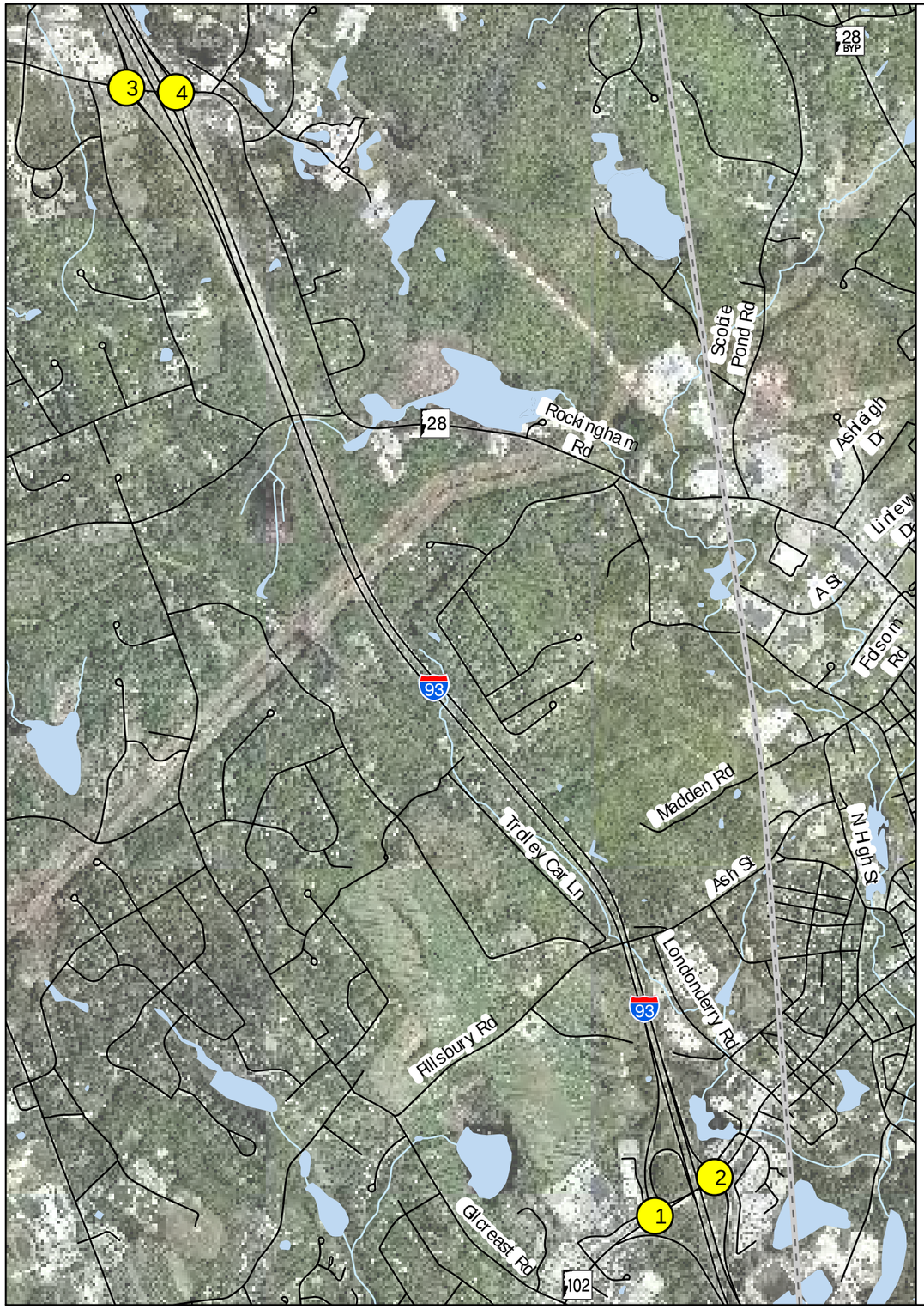
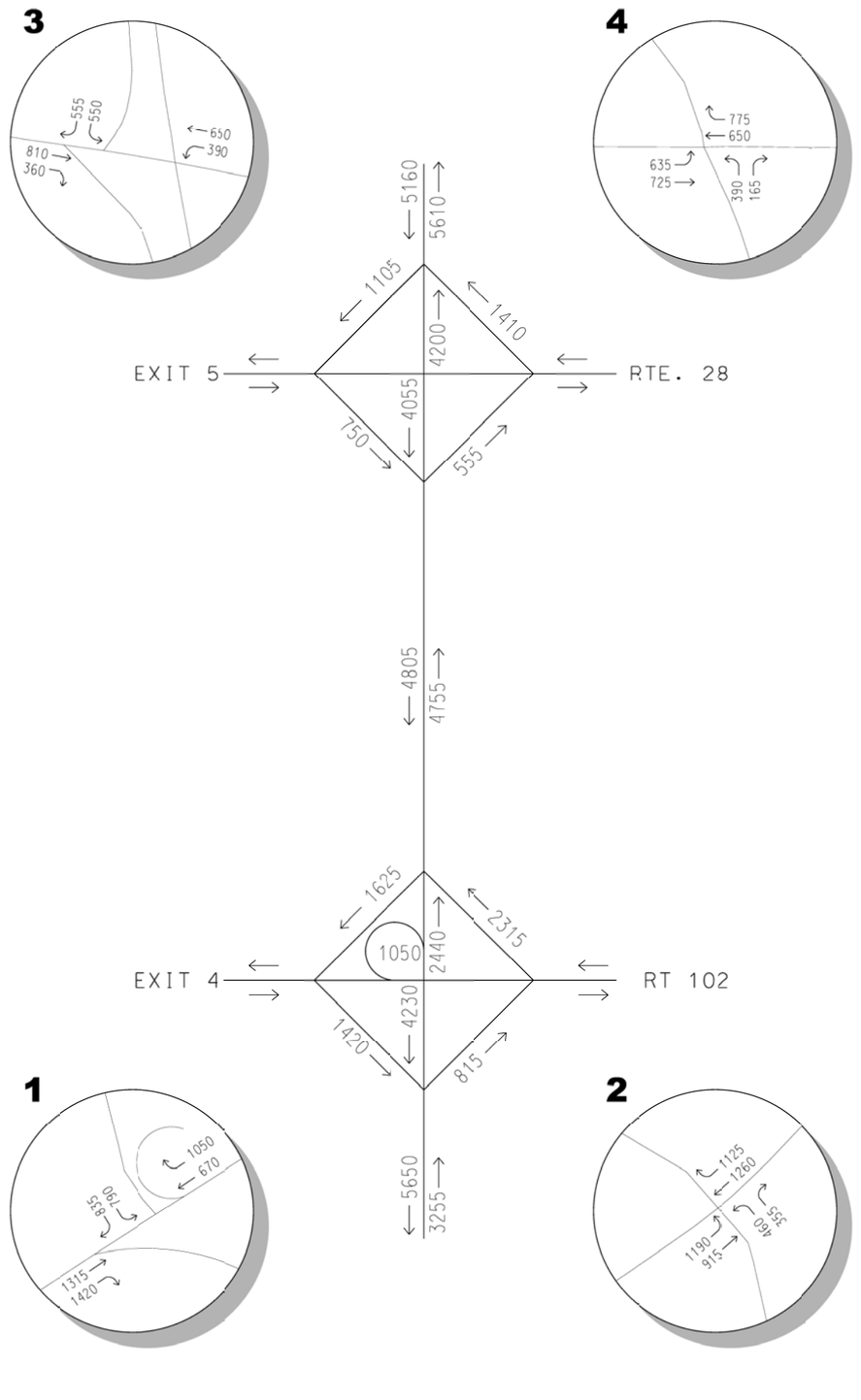


Figure 14 - SNHPC Traffic Analysis Zones - Region wide





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Supplemental Draft EIS

2040 NO-BUILD AM PEAK HOUR BASE VOLUMES

INDEX

1. Exit 4 SB Ramps
2. Exit 4 NB Ramps
3. Exit 5 SB Ramps
4. Exit 5 NB Ramps

Feet
0 1,000 2,000

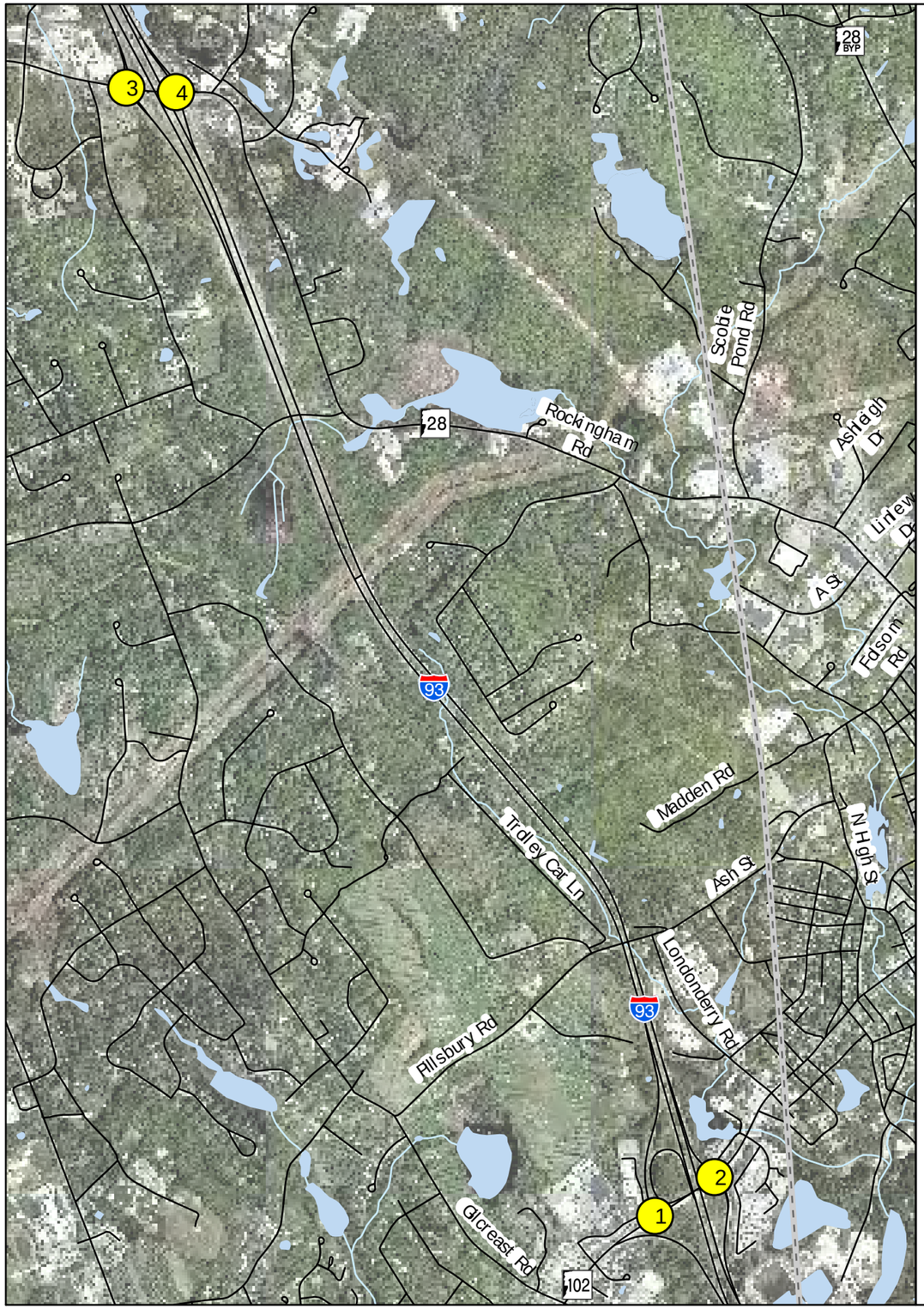
Sources:

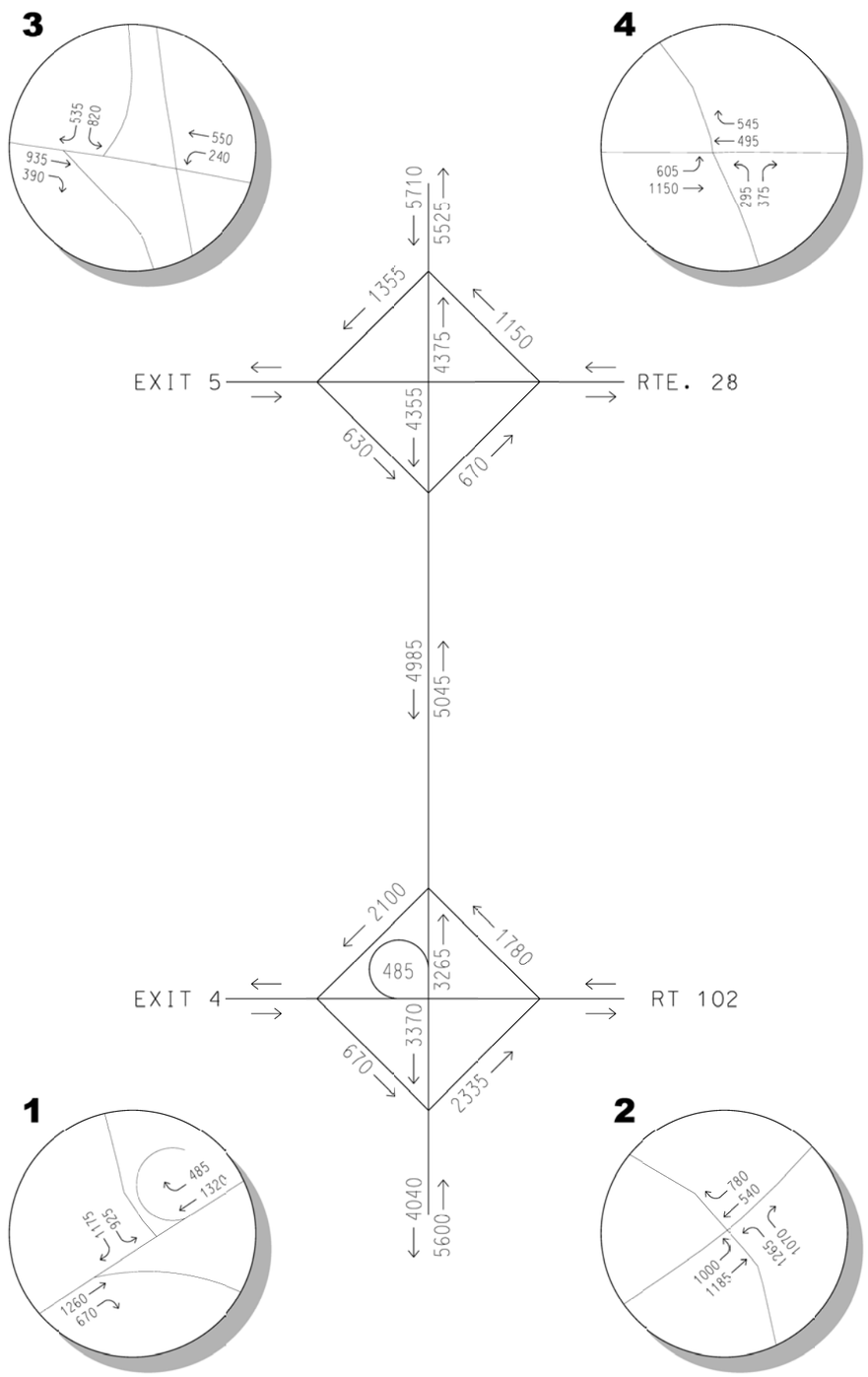
Coordinate System
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 15 - 2040 No-Build AM Peak Hour Base Volumes – Locations 1-4





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Supplemental Draft EIS

2040 NO-BUILD PM PEAK HOUR BASE VOLUMES

INDEX

1. Exit 4 SB Ramps
2. Exit 4 NB Ramps
3. Exit 5 SB Ramps
4. Exit 5 NB Ramps

Feet
0 1,000 2,000

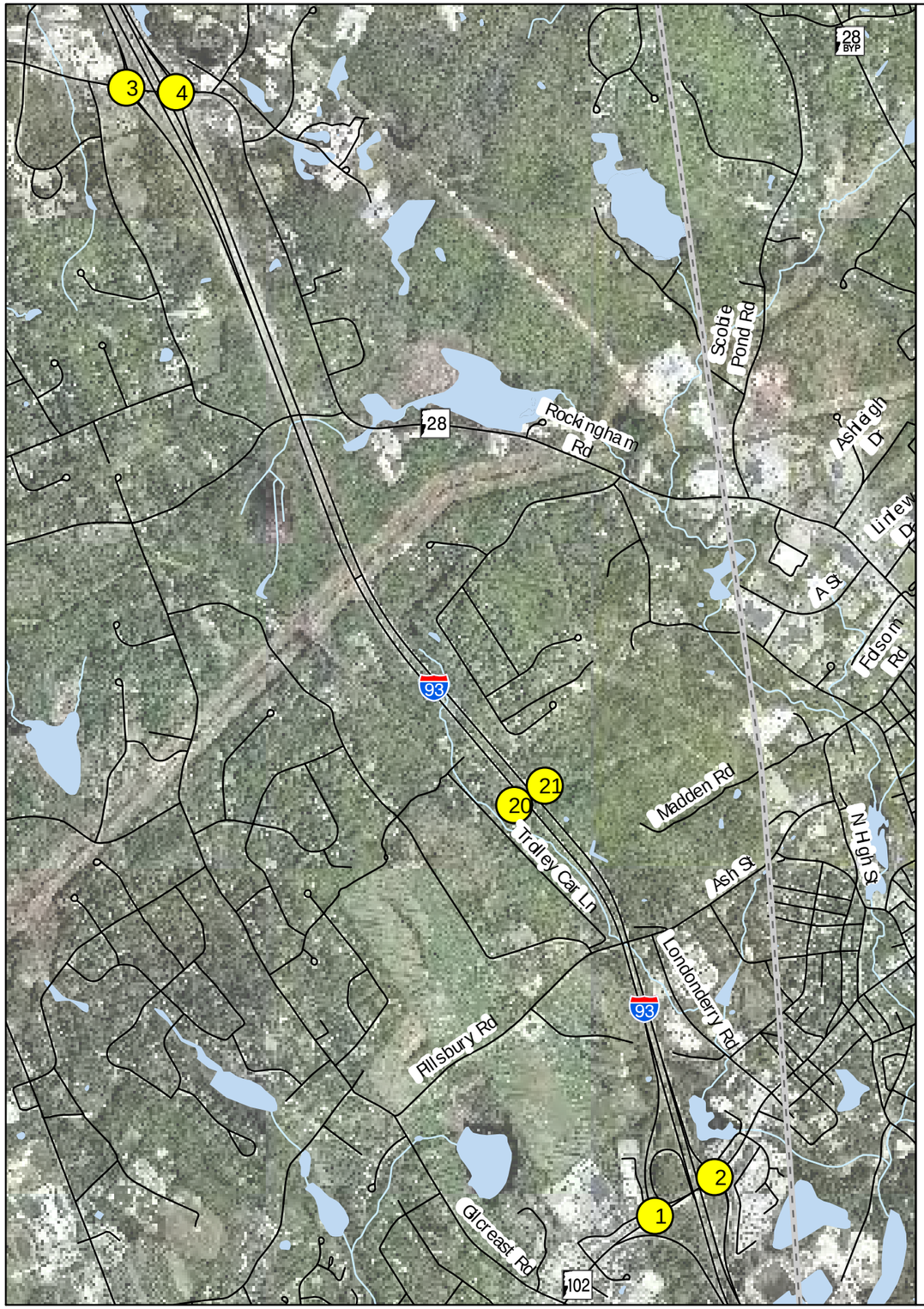
Sources:

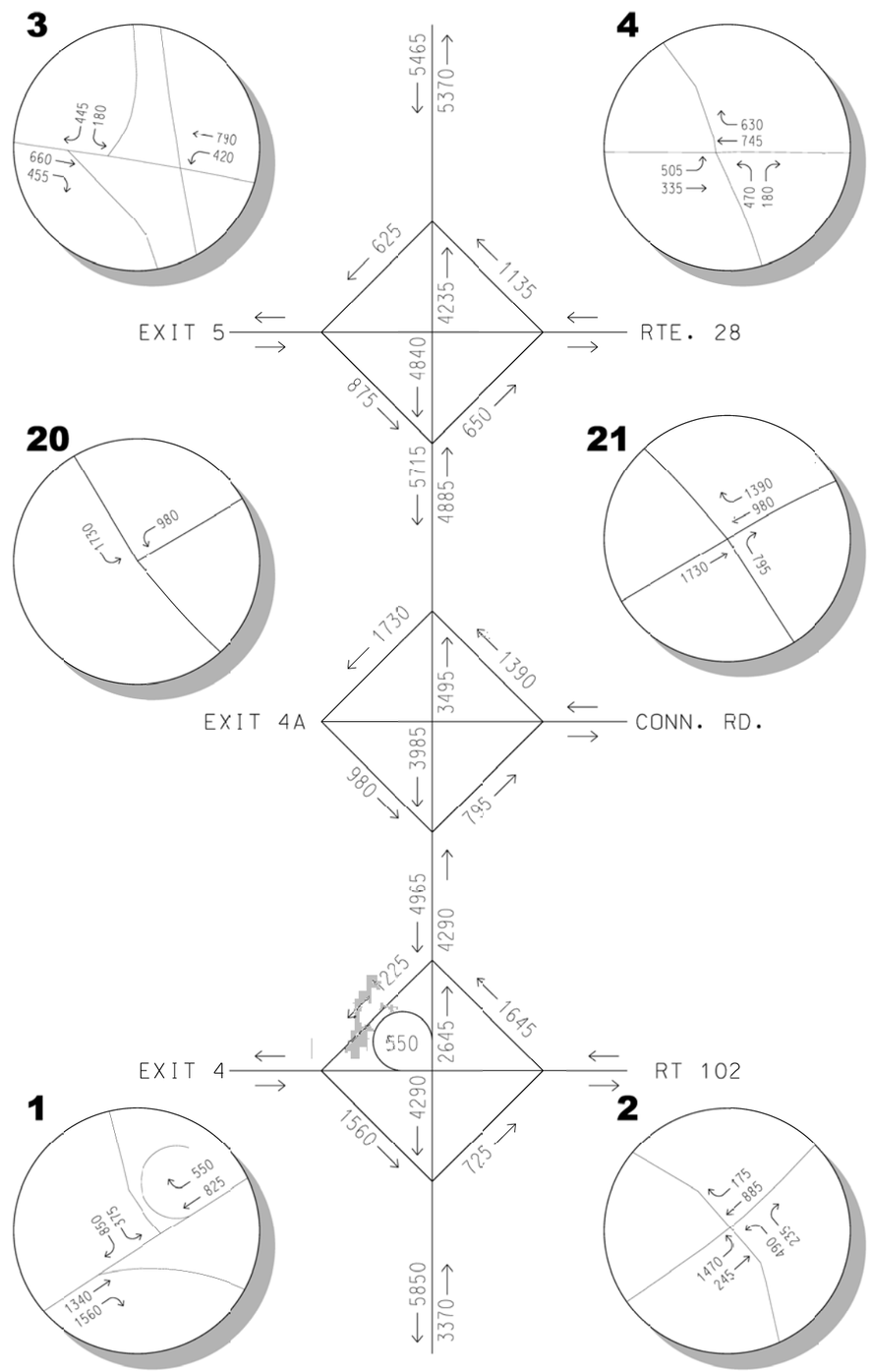
Coordinate System
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 16 - 2040 No-Build PM Peak Hour Base Volumes – Locations 1-4





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2040 ALT A AM PEAK HOUR BASE VOLUMES

INDEX

1. Exit 4 SB Ramps
2. Exit 4 NB Ramps
3. Exit 5 SB Ramps
4. Exit 5 NB Ramps
20. Exit 4A SB Ramps
21. Exit 4A NB Ramps

Feet
0 1,000 2,000

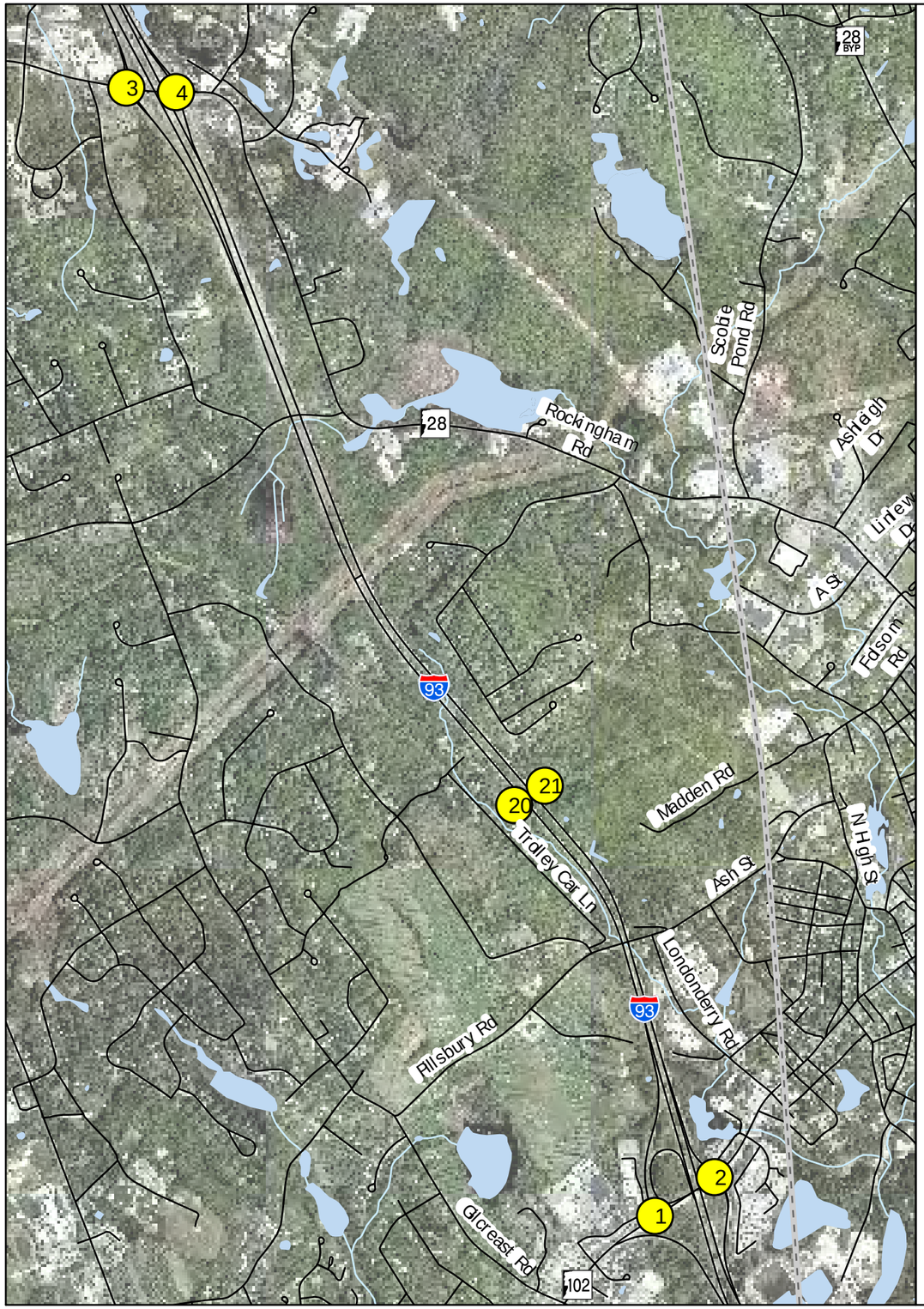
Sources:

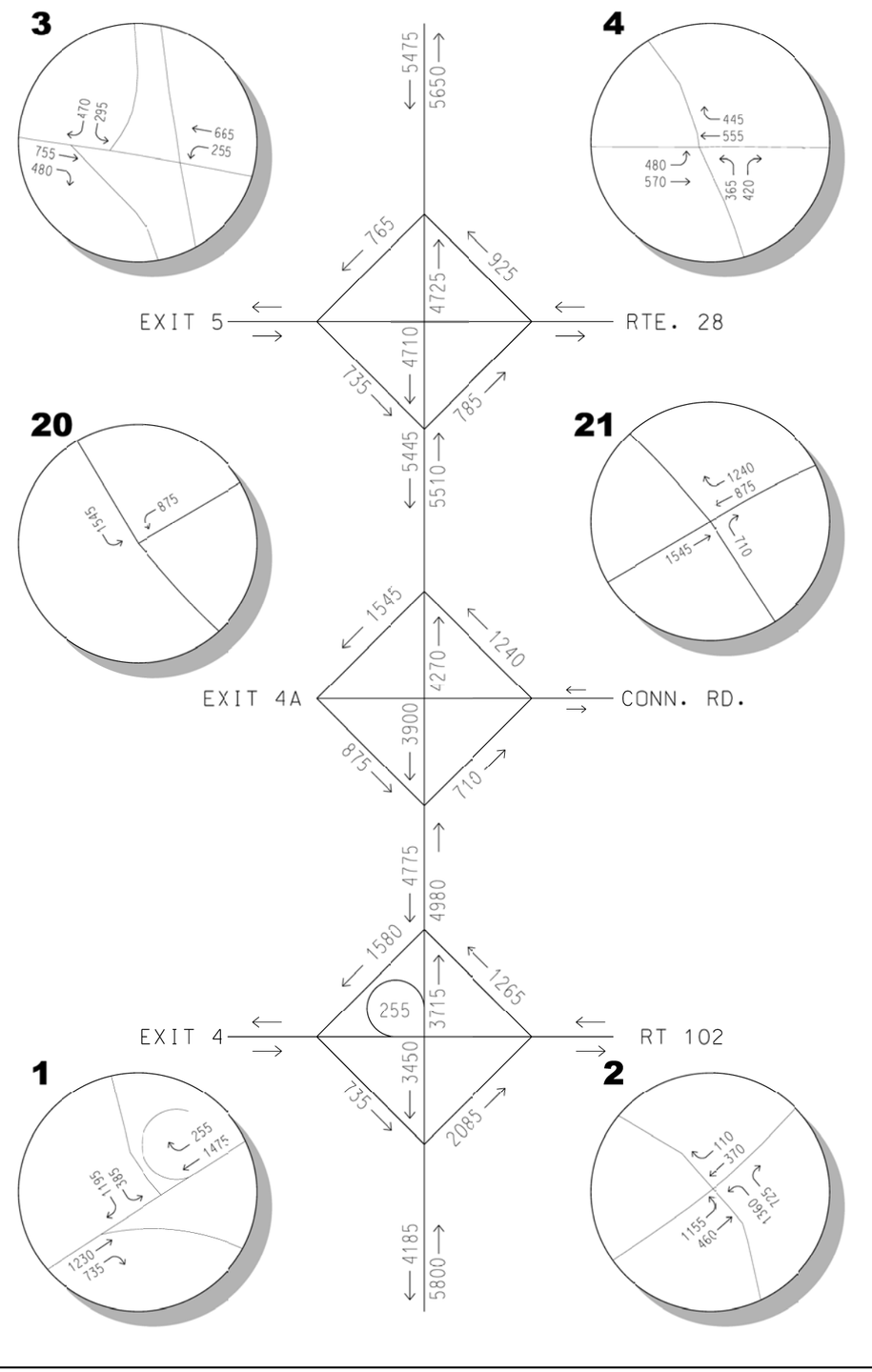
Coordinate System
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 17 - 2040 Alternative A AM Peak Hour Base Volumes – Locations 1-4 and 20-21





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2040 ALT A PM PEAK HOUR BASE VOLUMES

INDEX

1. Exit 4 SB Ramps
2. Exit 4 NB Ramps
3. Exit 5 SB Ramps
4. Exit 5 NB Ramps
20. Exit 4A SB Ramps
21. Exit 4A NB Ramps

Feet
0 1,000 2,000

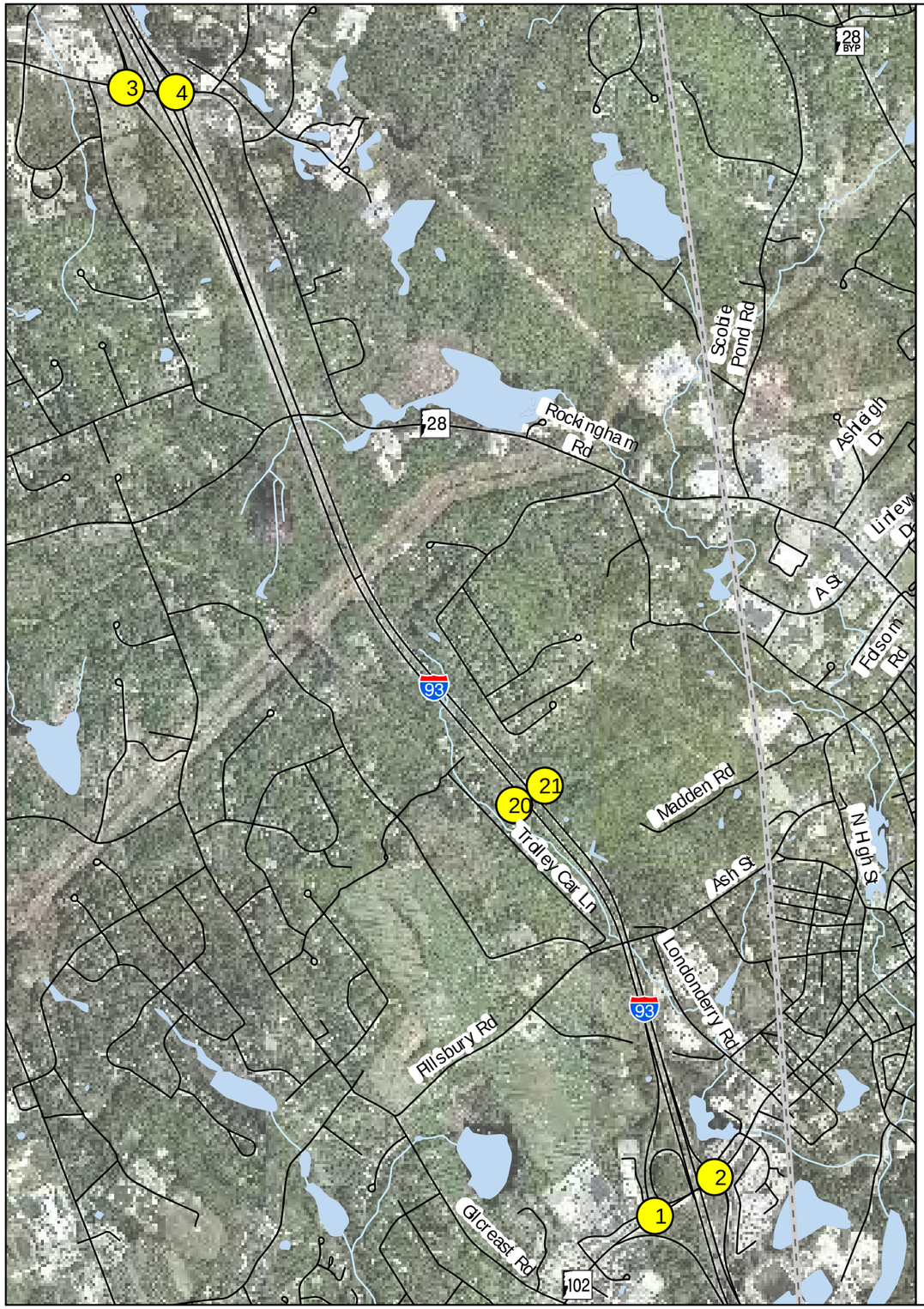
Sources:

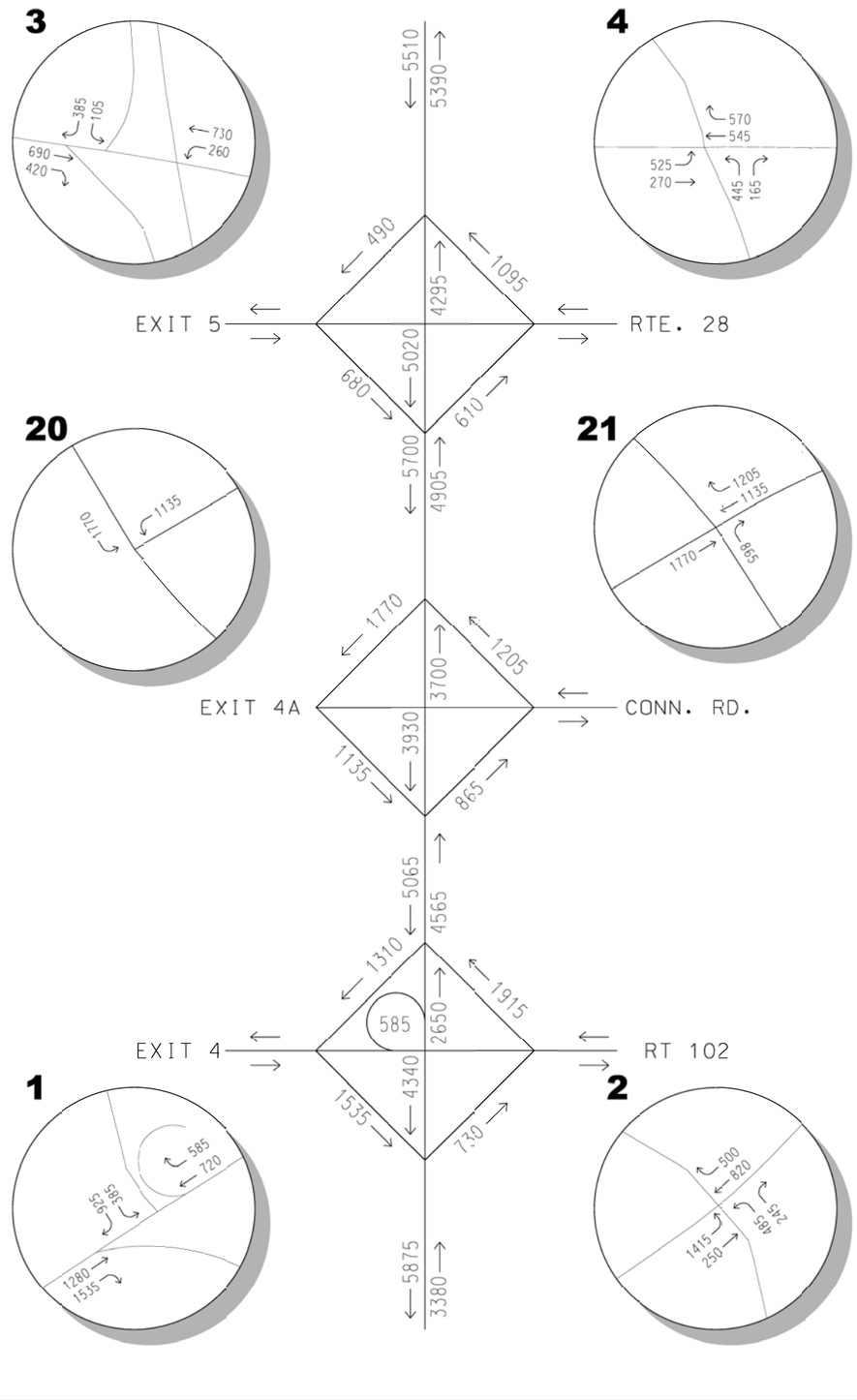
Coordinate System
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 18 - 2040 Alternative A PM Peak Hour Base Volumes – Locations 1-4 and 20-21





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2040 ALT B AM PEAK HOUR BASE VOLUMES

INDEX

1. Exit 4 SB Ramps
2. Exit 4 NB Ramps
3. Exit 5 SB Ramps
4. Exit 5 NB Ramps
20. Exit 4A SB Ramps
21. Exit 4A NB Ramps

Feet
0 1,000 2,000

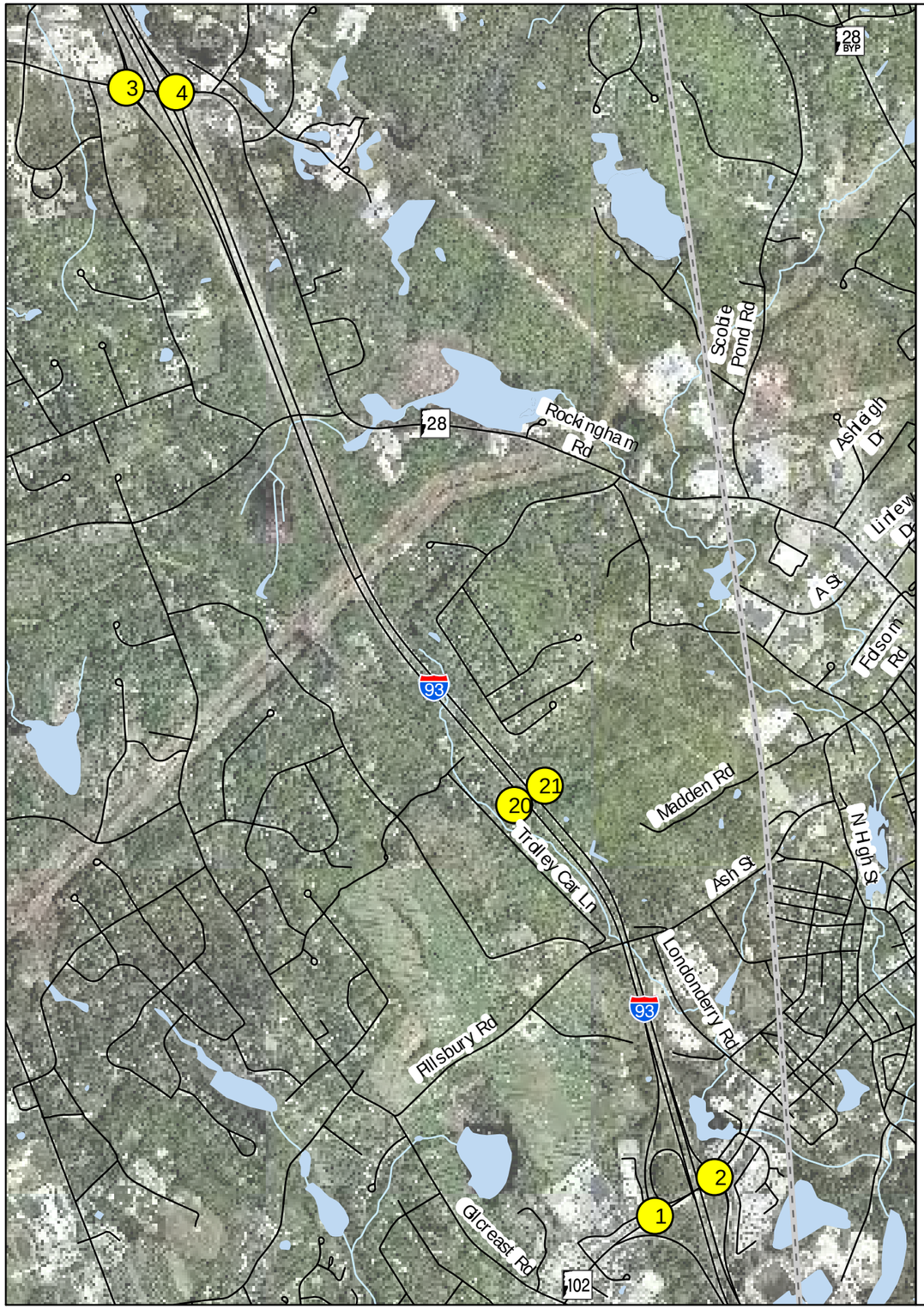
Sources:

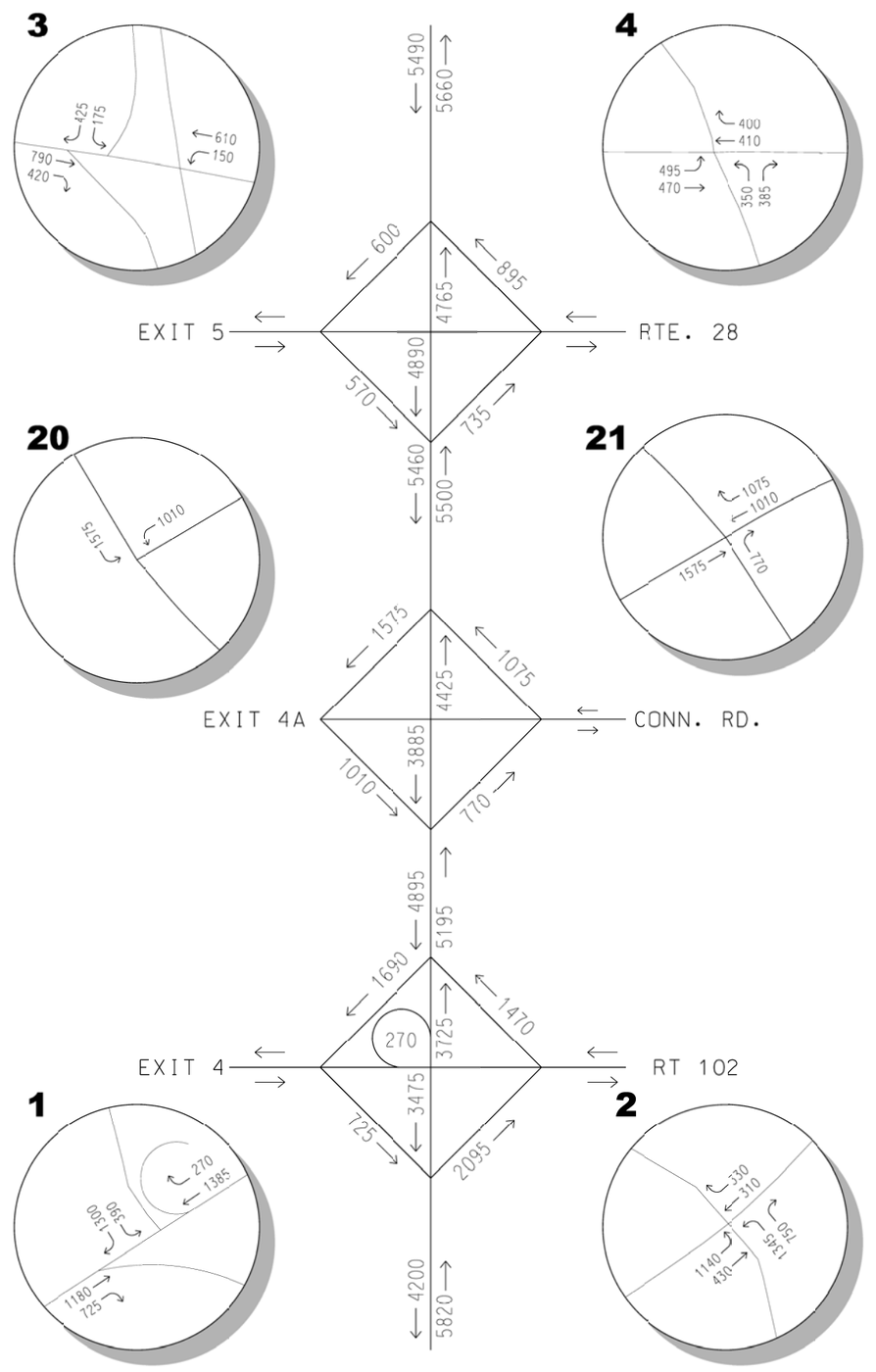
Coordinate System:
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 19 - 2040 Alternative B AM Peak Hour Base Volumes – Locations 1-4 and 20-21





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2040 ALT B PM PEAK HOUR BASE VOLUMES

INDEX

1. Exit 4 SB Ramps
2. Exit 4 NB Ramps
3. Exit 5 SB Ramps
4. Exit 5 NB Ramps
20. Exit 4A SB Ramps
21. Exit 4A NB Ramps

Feet
0 1,000 2,000

Sources:

Coordinate System
NAD 1983 StatePlane
New Hampshire (feet)

Date:
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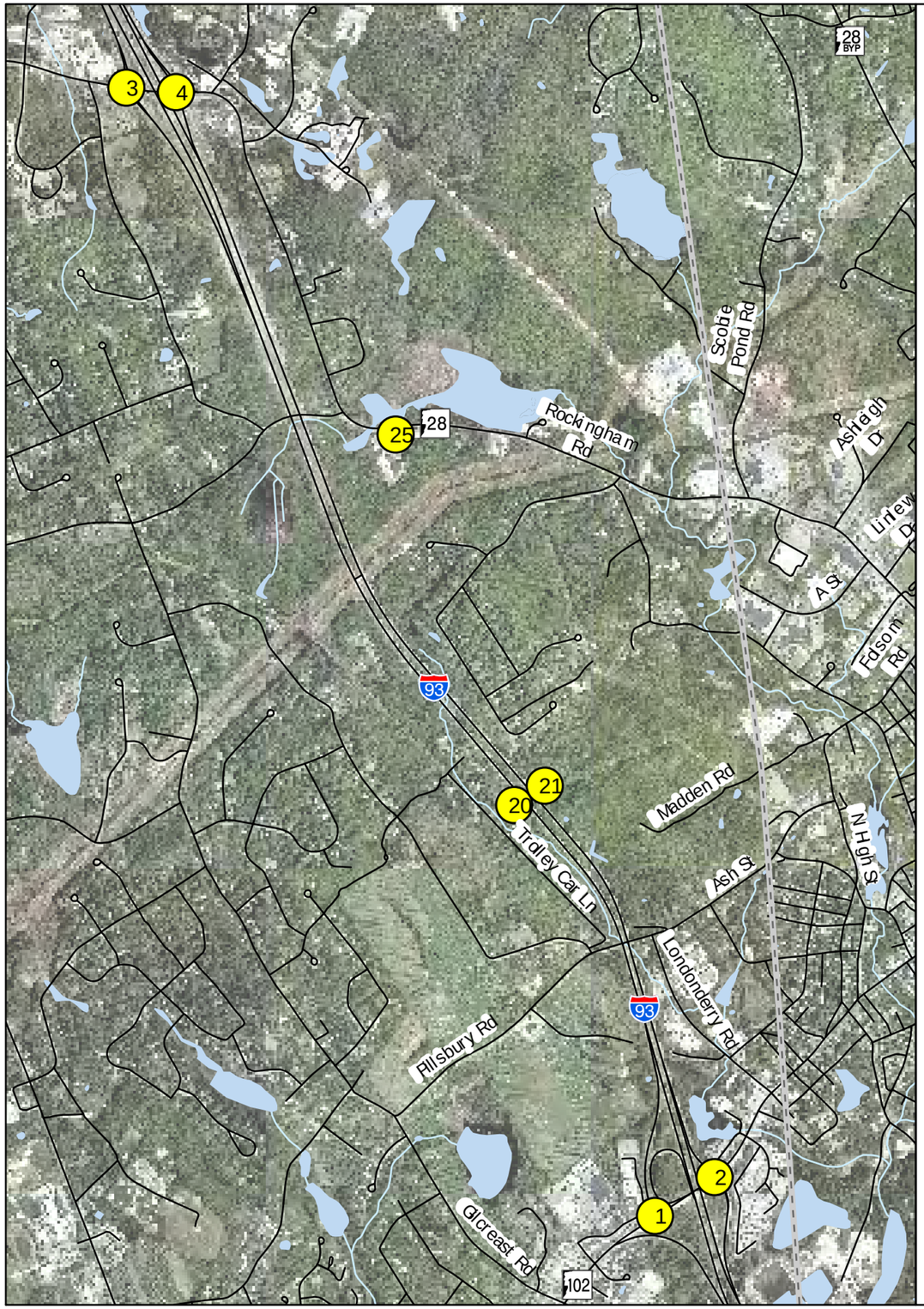
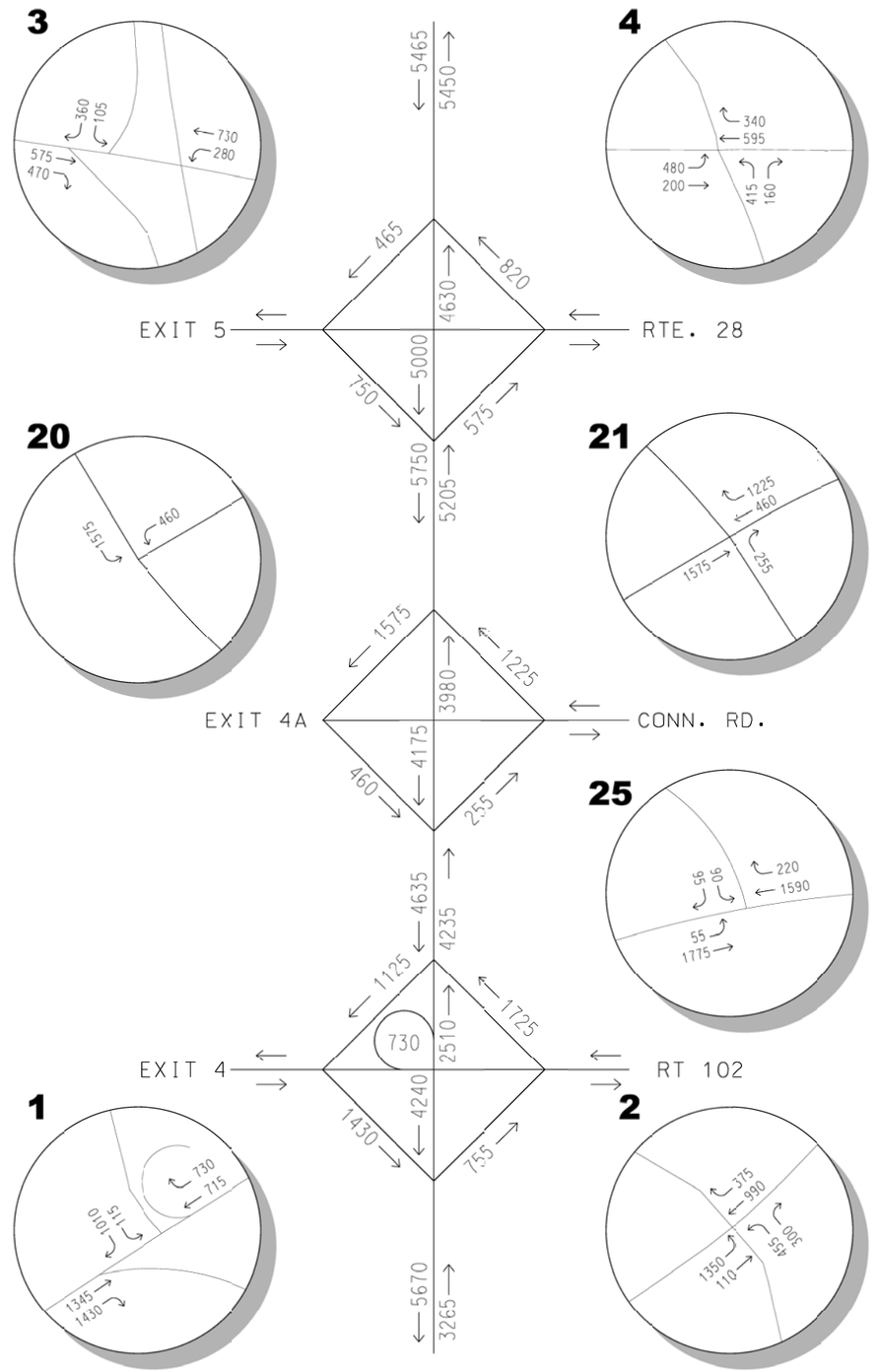
New Hampshire DOT
Department of Transportation

Figure 20 - 2040 Alternative B PM Peak Hour Base Volumes – Locations 1-4 and 20-21





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2040 ALT C AM PEAK HOUR BASE VOLUMES

INDEX

1. Exit 4 SB Ramps
2. Exit 4 NB Ramps
3. Exit 5 SB Ramps
4. Exit 5 NB Ramps
20. Exit 4A SB Ramps
21. Exit 4A NB Ramps
25. NH 28/ C-D Connector

Feet
0 1,000 2,000

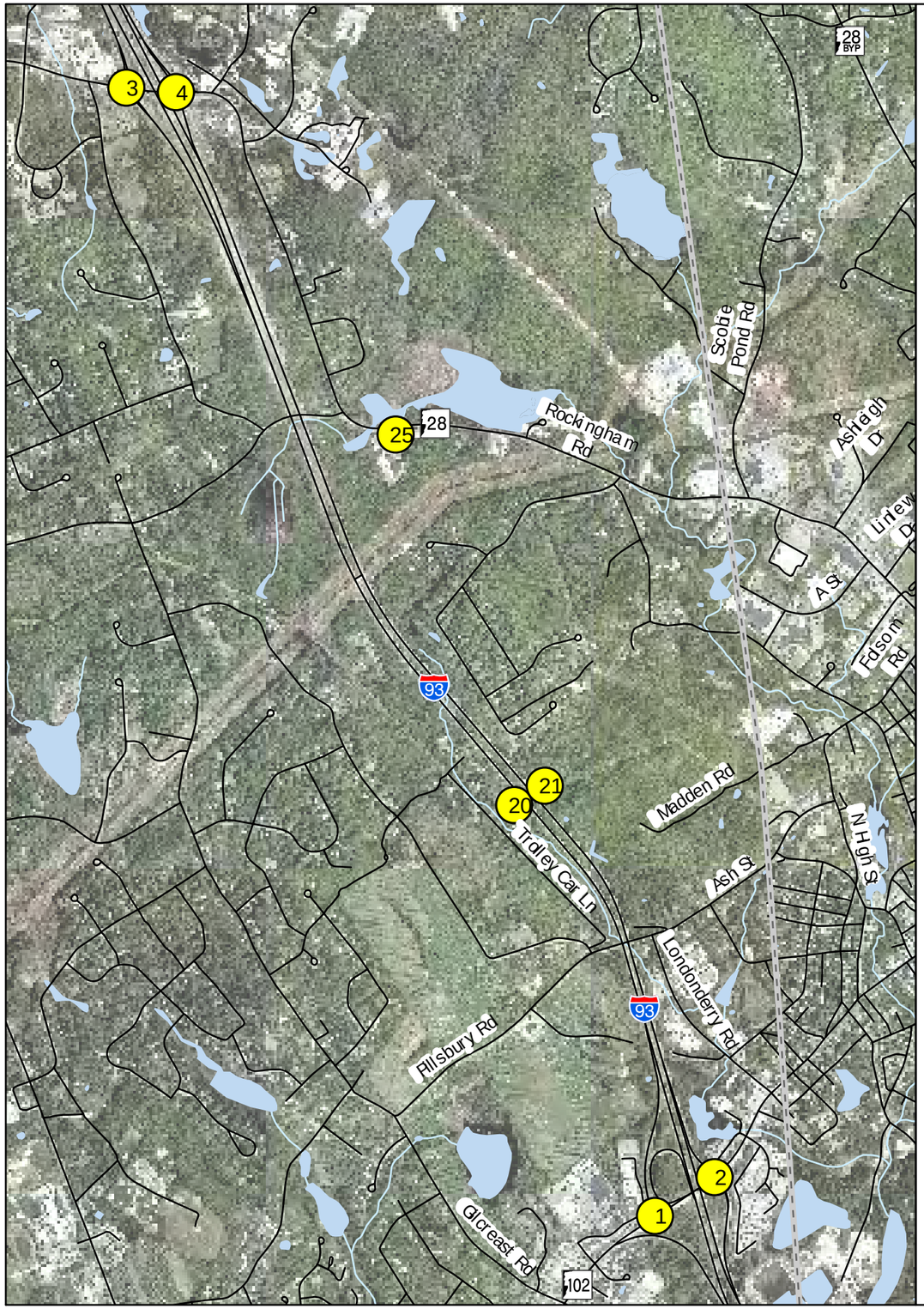
Sources:

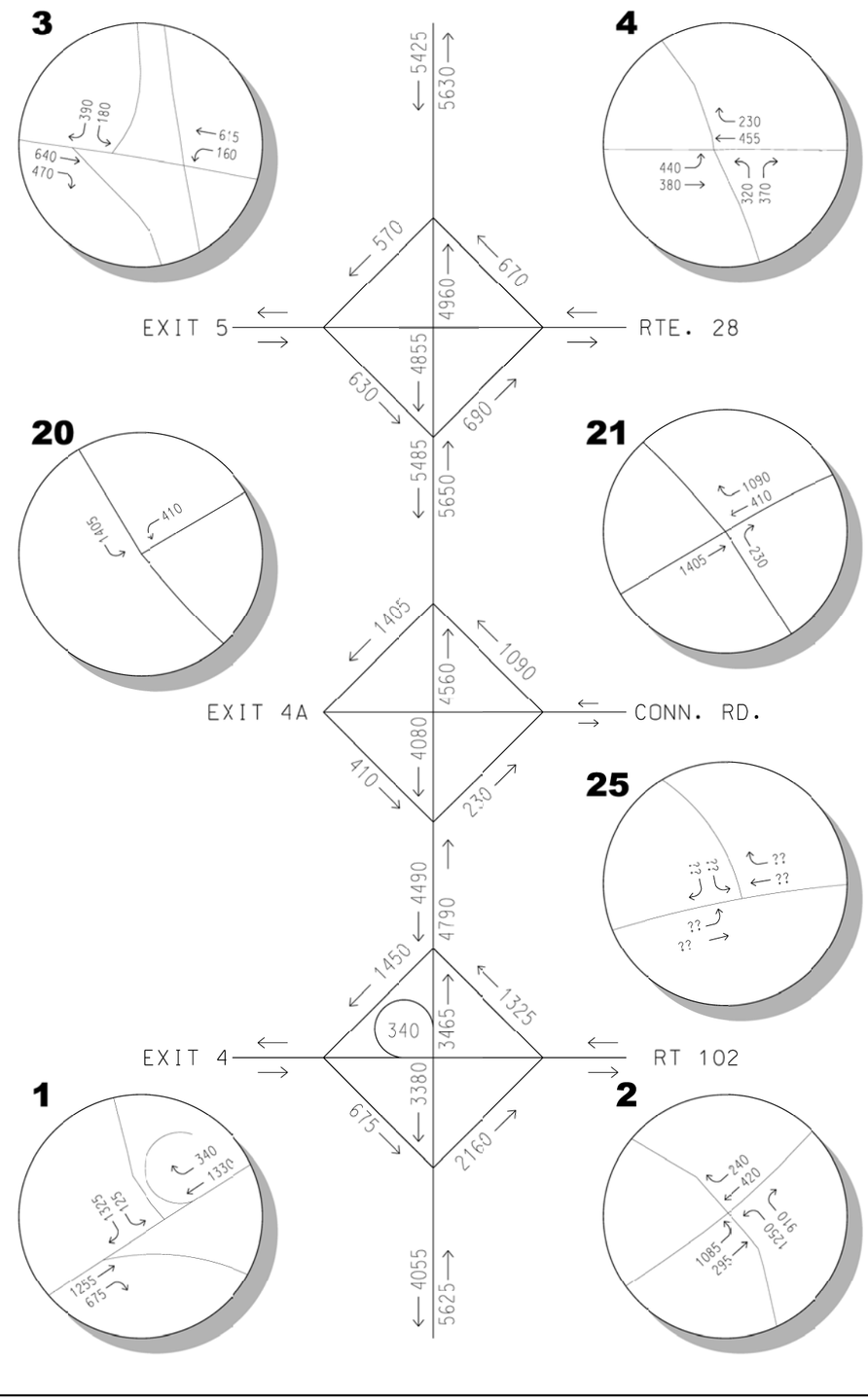
Coordinate System:
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 21 - 2040 Alternative C AM Peak Hour Base Volumes – Locations 1-4, 20-21, and 25





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2040 ALT C PM PEAK HOUR BASE VOLUMES

INDEX

1. Exit 4 SB Ramps
2. Exit 4 NB Ramps
3. Exit 5 SB Ramps
4. Exit 5 NB Ramps
20. Exit 4A SB Ramps
21. Exit 4A NB Ramps
25. NH 28/ C-D Connector

Feet
0 1,000 2,000

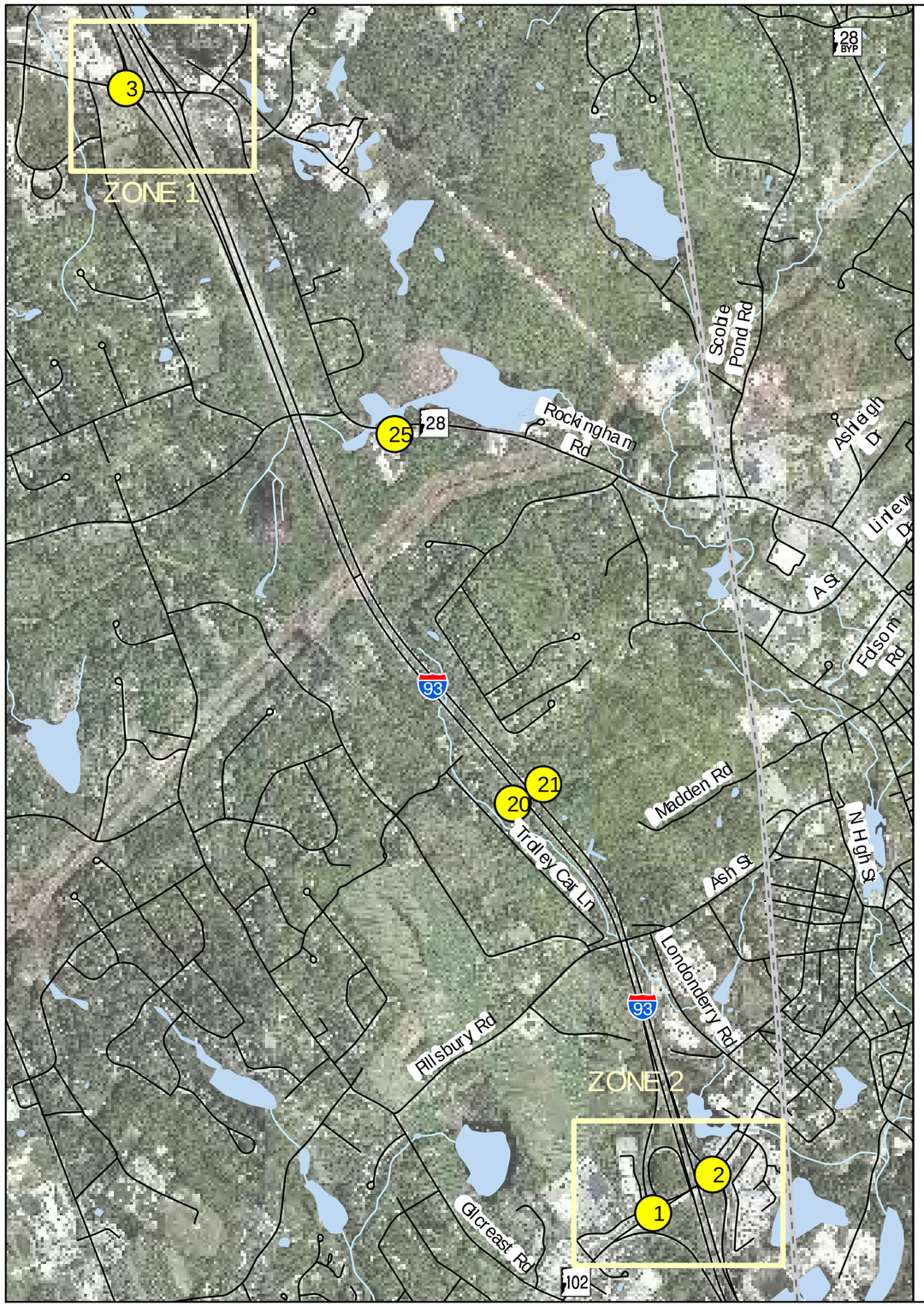
Sources:

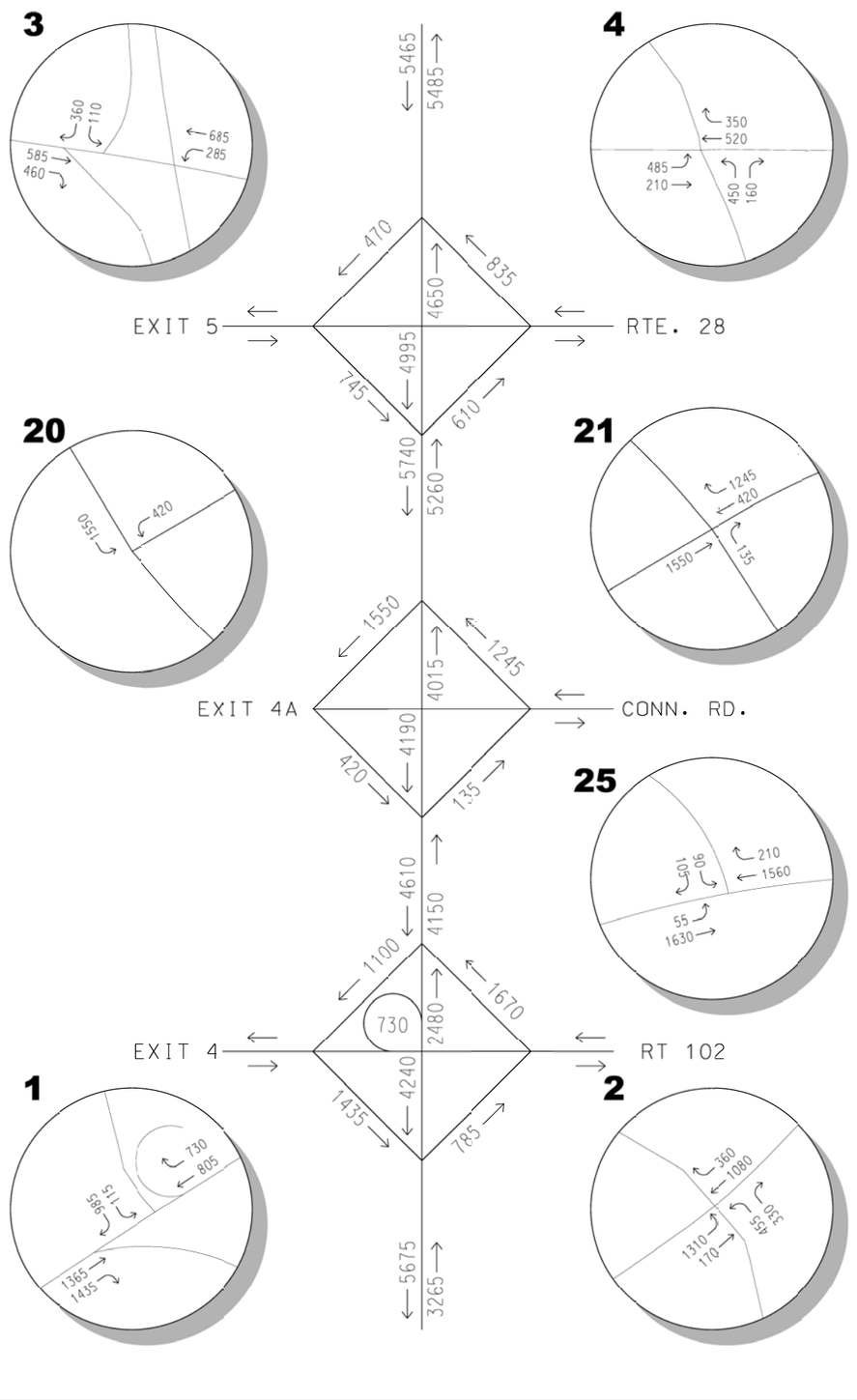
Coordinate System
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 22 - 2040 Alternative C PM Peak Hour Base Volumes – Locations 1-4, 20-21, and 25





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2040 ALT D AM PEAK HOUR BASE VOLUMES

INDEX

1. Exit 4 SB Ramps
2. Exit 4 NB Ramps
3. Exit 5 SB Ramps
4. Exit 5 NB Ramps
20. Exit 4A SB Ramps
21. Exit 4A NB Ramps
25. NH 28/ C-D Connector

Feet
0 1,000 2,000

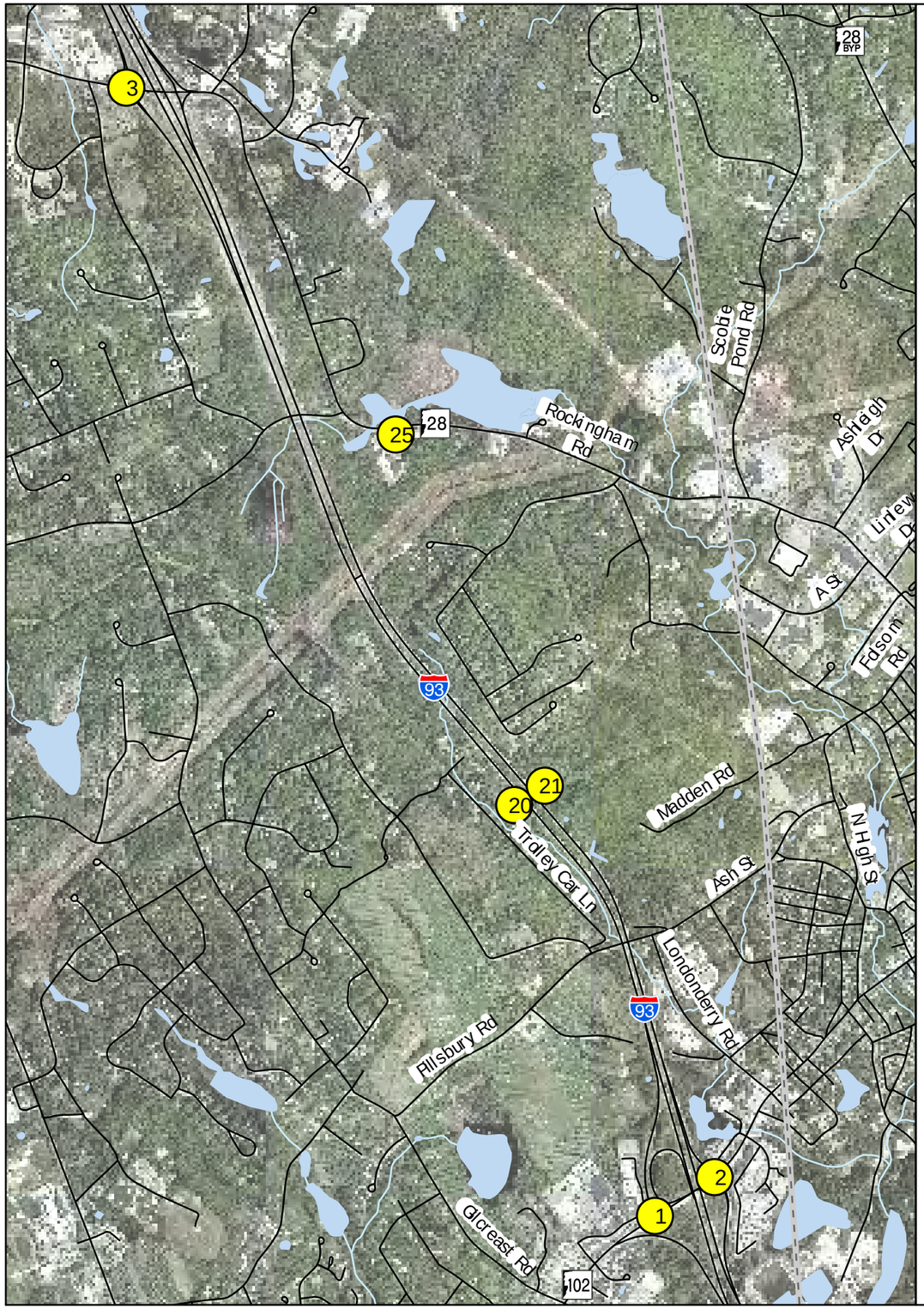
Sources:

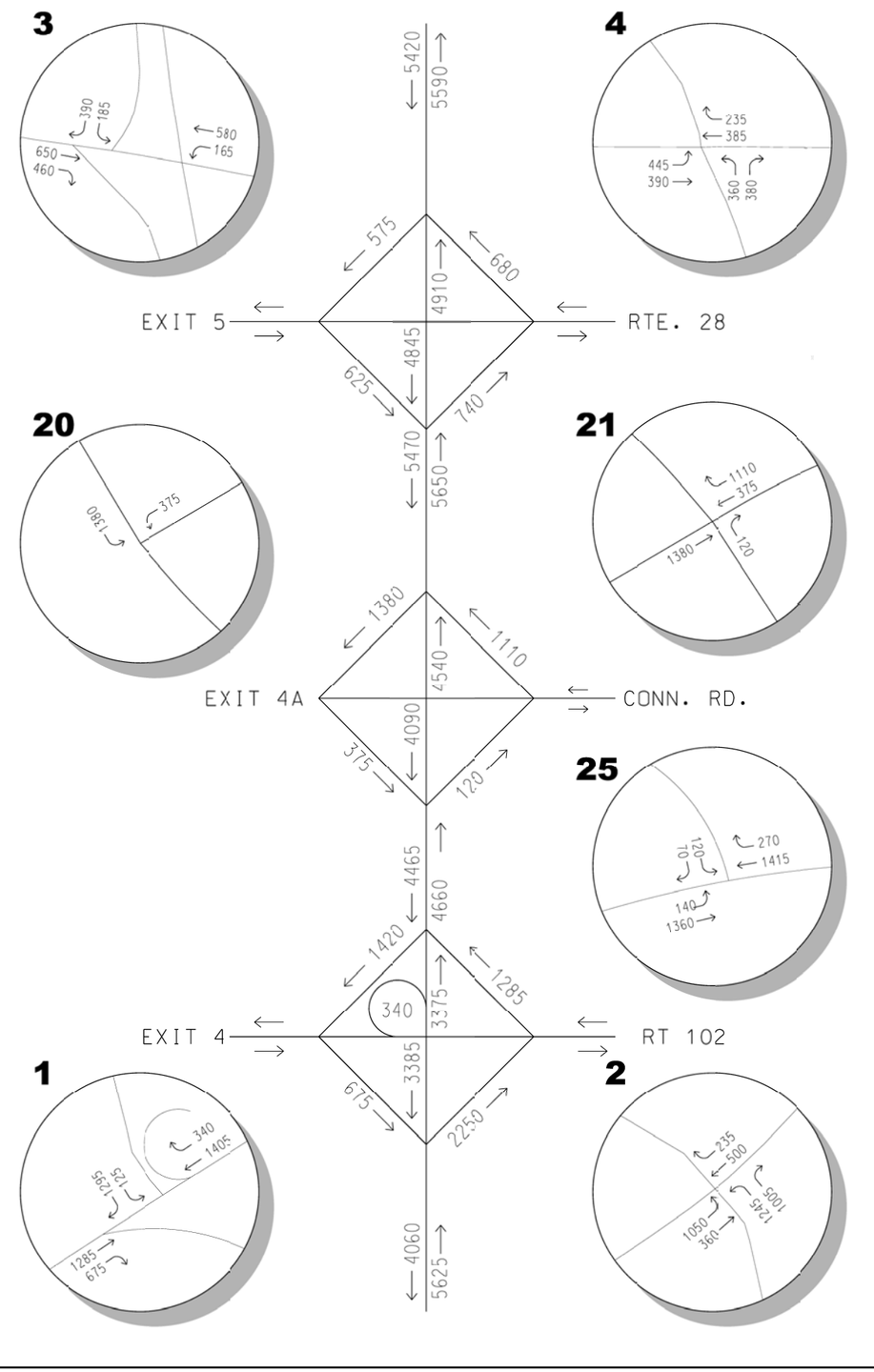
Coordinate System
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 23 - 2040 Alternative D AM Peak Hour Base Volumes – Locations 1-4, 20-21, and 25





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2040 ALT D PM PEAK HOUR BASE VOLUMES

INDEX

1. Exit 4 SB Ramps
2. Exit 4 NB Ramps
3. Exit 5 SB Ramps
4. Exit 5 NB Ramps
20. Exit 4A SB Ramps
21. Exit 4A NB Ramps
25. NH 28/ C-D Connector

Feet
0 1,000 2,000

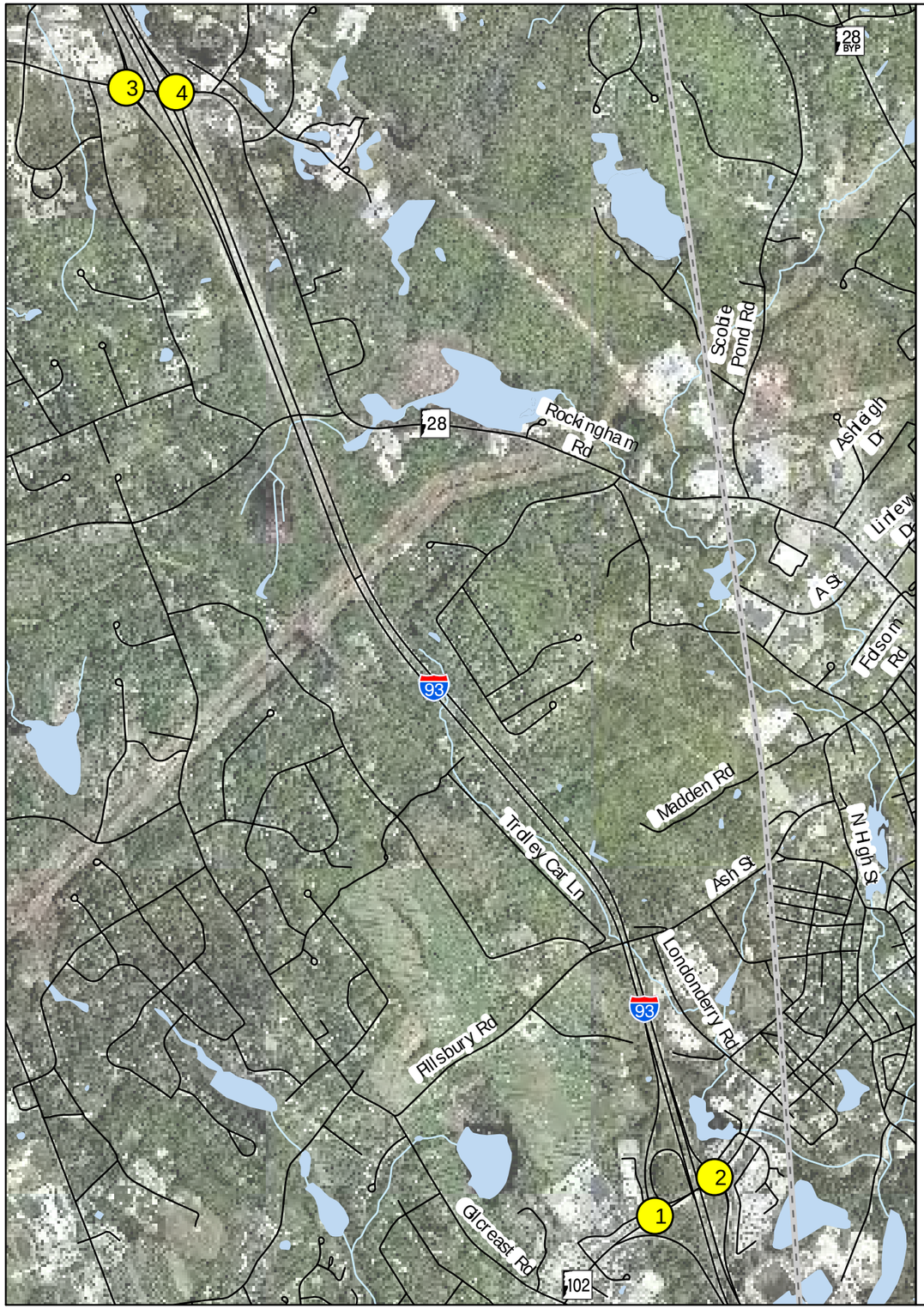
Sources:

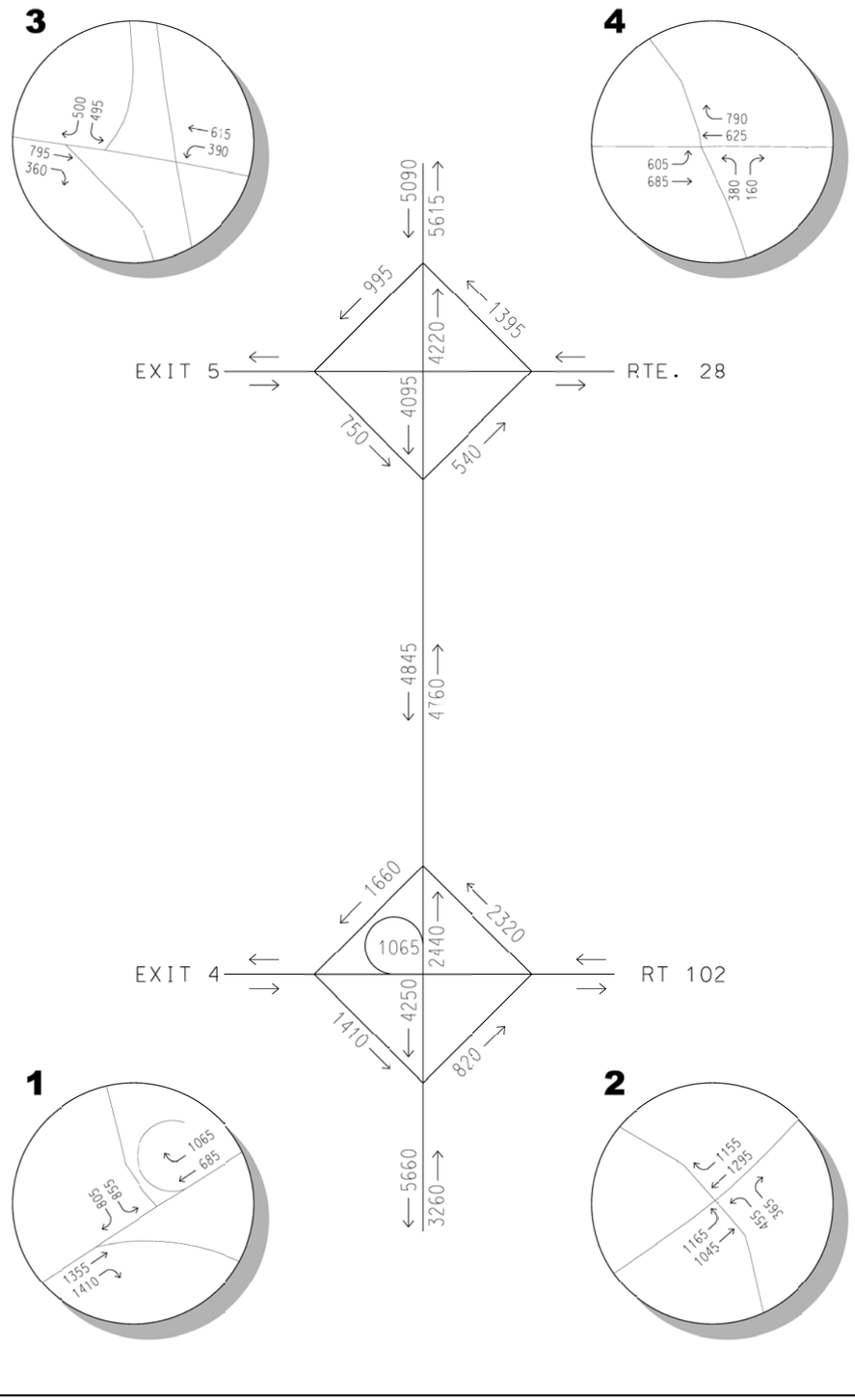
Coordinate System
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 24 - 2040 Alternative D PM Peak Hour Base Volumes – Locations 1-4, 20-21, and 25





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2040 ALT F AM PEAK HOUR BASE VOLUMES

INDEX

1. Exit 4 SB Ramps
2. Exit 4 NB Ramps
3. Exit 5 SB Ramps
4. Exit 5 NB Ramps

Feet
0 1,000 2,000

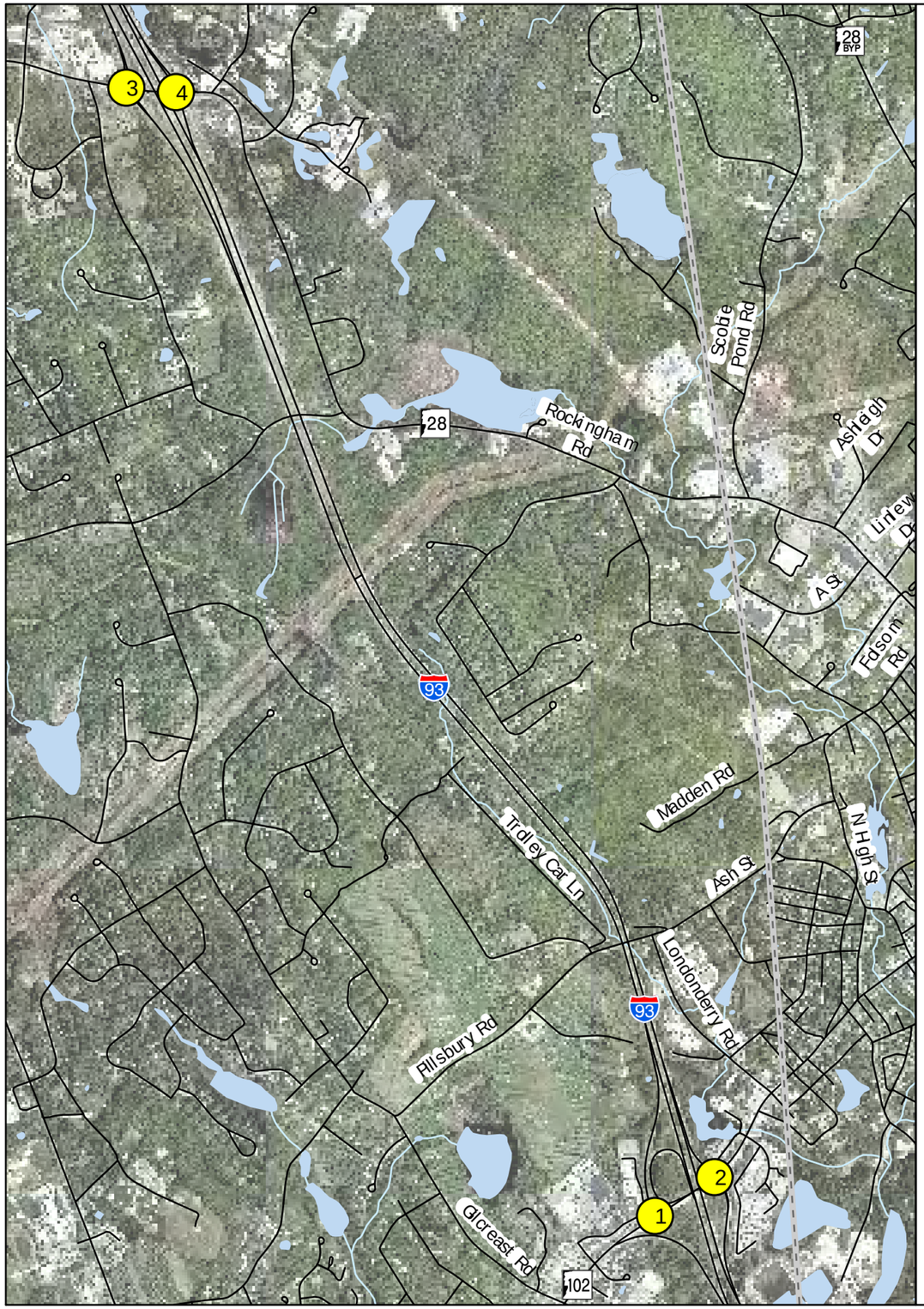
Sources:

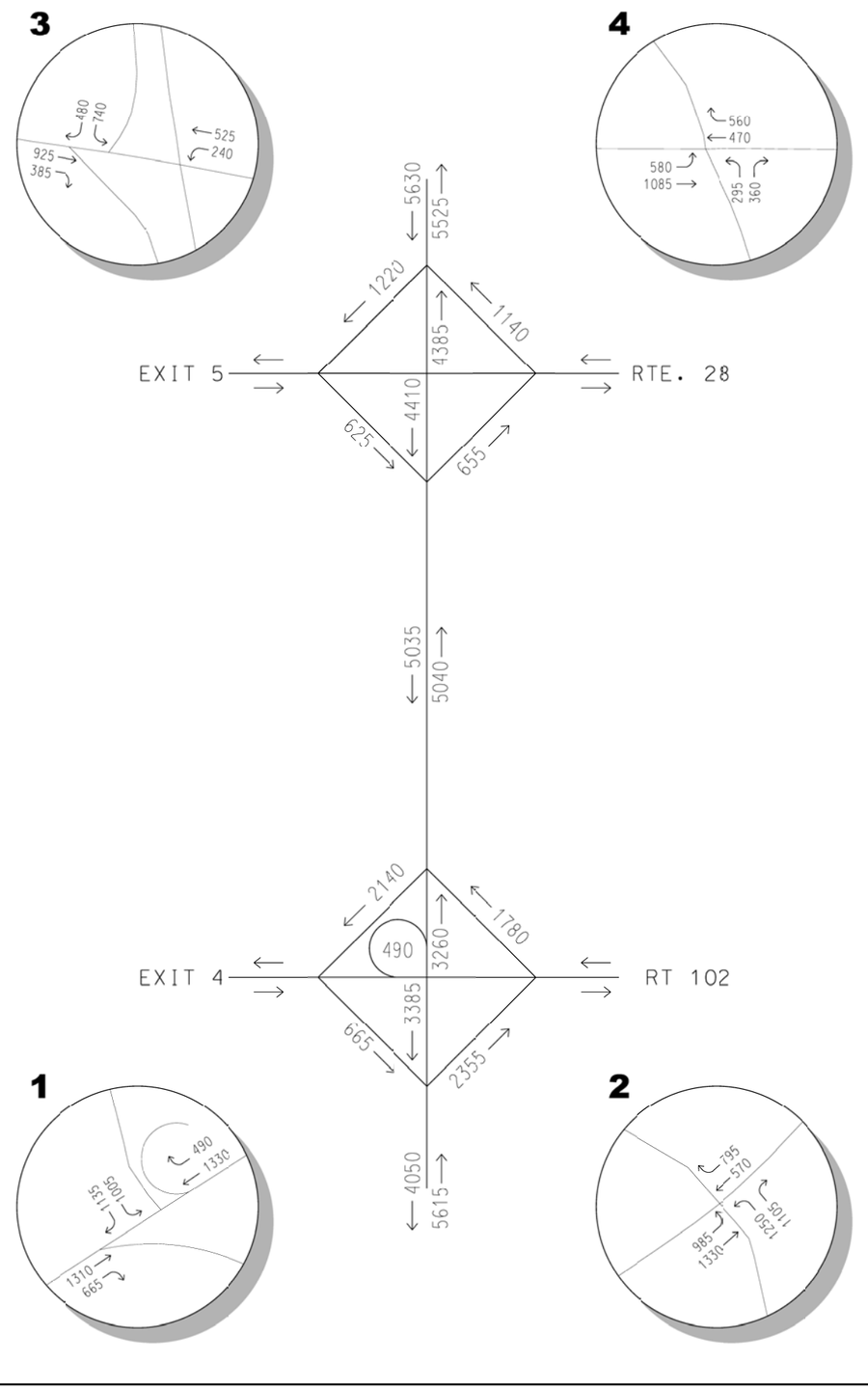
Coordinate System
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 25 - 2040 Alternative F AM Peak Hour Base Volumes – Locations 1-4





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2040 ALT F PM PEAK HOUR BASE VOLUMES

INDEX

1. Exit 4 SB Ramps
2. Exit 4 NB Ramps
3. Exit 5 SB Ramps
4. Exit 5 NB Ramps

Feet
0 1,000 2,000

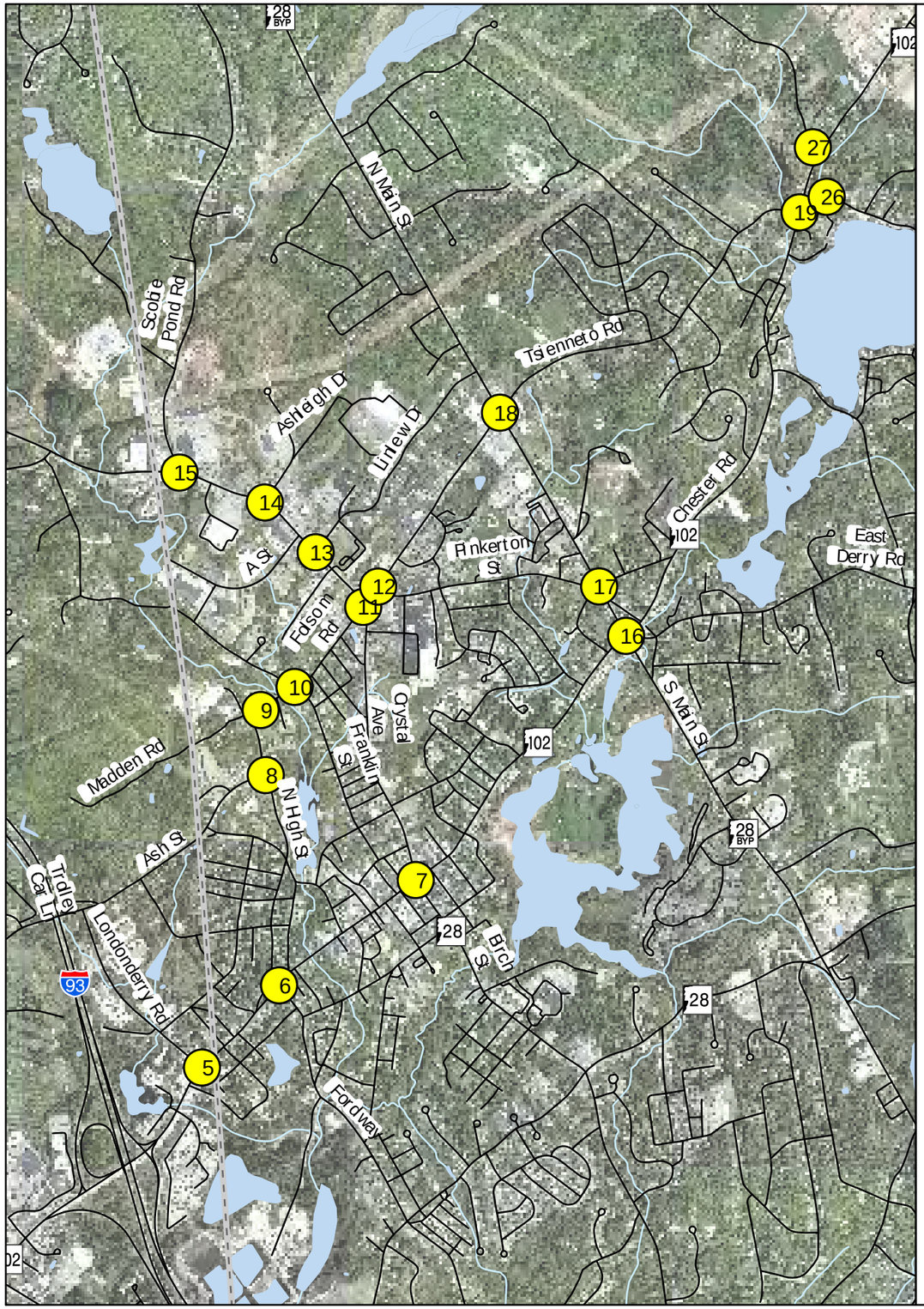
Sources:

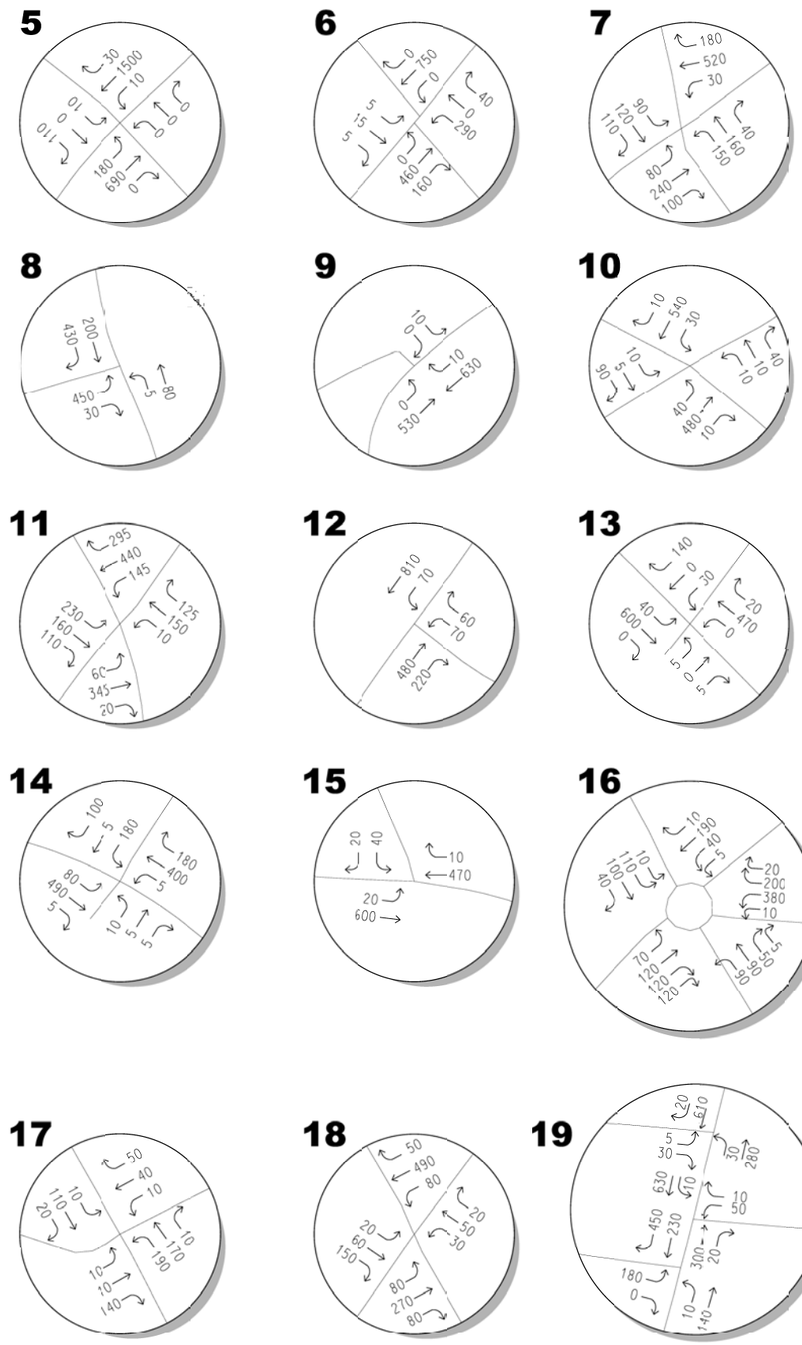
Coordinate System
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 26 - 2040 Alternative F PM Peak Hour Base Volumes – Locations 1-4





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2040 NO-BUILD AM PEAK HOUR BASE VOLUMES

INDEX

5. NH 102/ Londonderry Road
6. NH 102/ Fordway/ High St.
7. NH 102/ NH 28
8. N High St./ Ash St. Extension
9. N High St./ Madden Rd.
10. N High St./ Fdsom Rd./ Franklin St.
11. NH 28/ Fdsom Rd./ Tsienneto Rd.
12. Tsienneto Rd./ Pinkerton St.
13. NH 28/ Linlew Dr.
14. NH28/ Ashleigh Dr.
15. NH 28/ Scobie Pond Rd.
16. NH 102/ NH 28 Bypass/ E. Derry Rd.
17. NH 28 Bypass/ Pinkerton St.
18. NH 28 Bypass/ Tsienneto Rd.
19. NH 102/ Tsienneto Rd.
26. NH 102/ North Shore Rd
27. NH 102/ English Range Rd

Feet
0 1,000 2,000

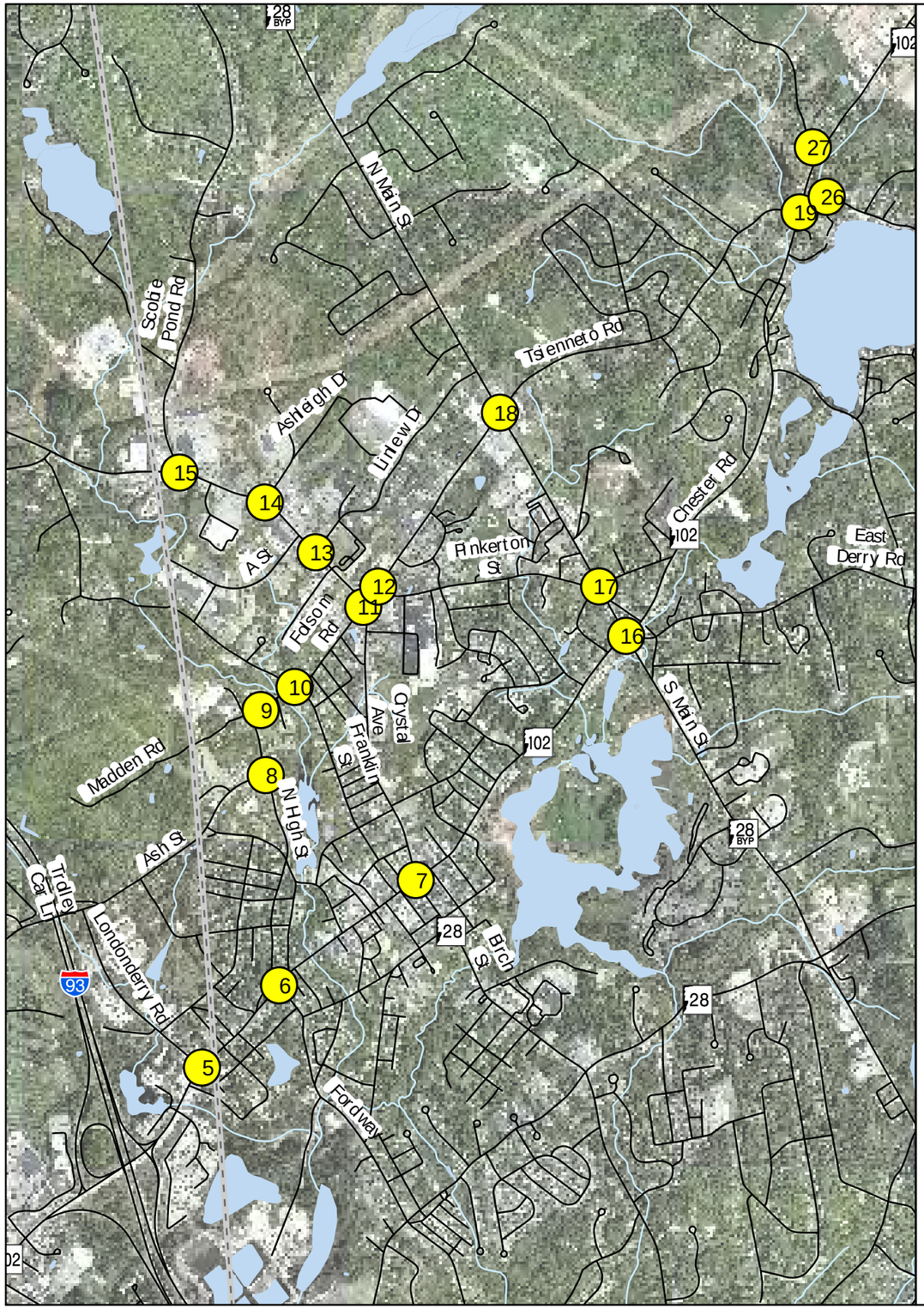
Sources:

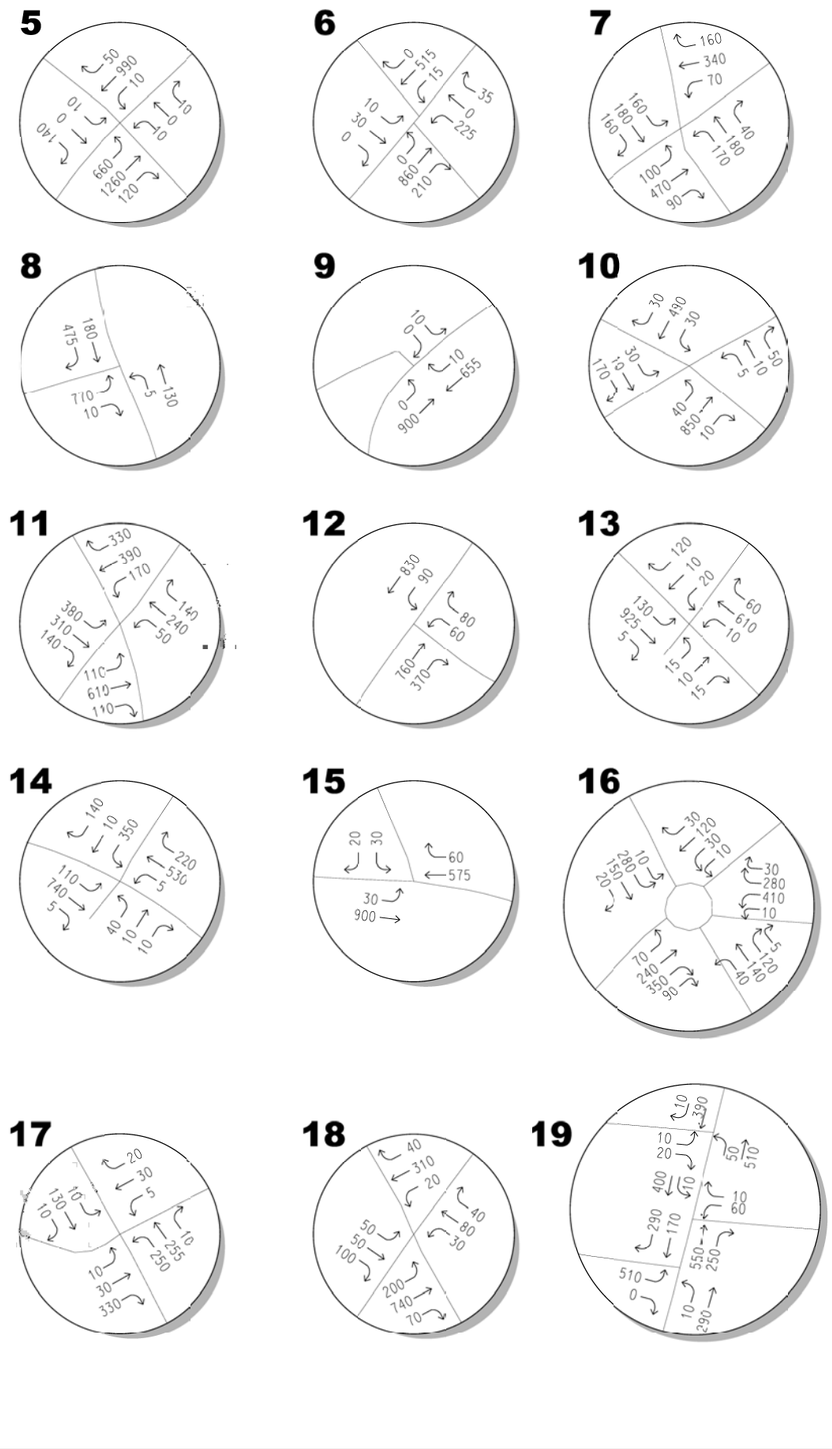
Coordinate System:
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 27 - 2040 No-Build AM Peak Hour Base Volumes – Locations 5-19 and 26-27





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Supplemental Draft EIS

2040 NO-BUILD PM PEAK HOUR BASE VOLUMES

INDEX

5. NH 102/ Londonderry Road
6. NH 102/ Fordway/ High St.
7. NH 102/ NH 28
8. N High St./ Ash St. Extension
9. N High St./ Madden Rd.
10. N High St./ Fdsom Rd./ Franklin St.
11. NH 28/ Fdsom Rd./ Tsienneto Rd.
12. Tsienneto Rd./ Pinkerton St.
13. NH 28/ Linlew Dr.
14. NH28/ Ashleigh Dr.
15. NH 28/ Scobie Pond Rd.
16. NH 102/ NH 28 Bypass/ E. Derry Rd.
17. NH 28 Bypass/ Pinkerton St.
18. NH 28 Bypass/ Tsienneto Rd.
19. NH 102/ Tsienneto Rd.
26. NH 102/ North Shore Rd
27. NH 102/ English Range Rd

Feet
0 1,000 2,000

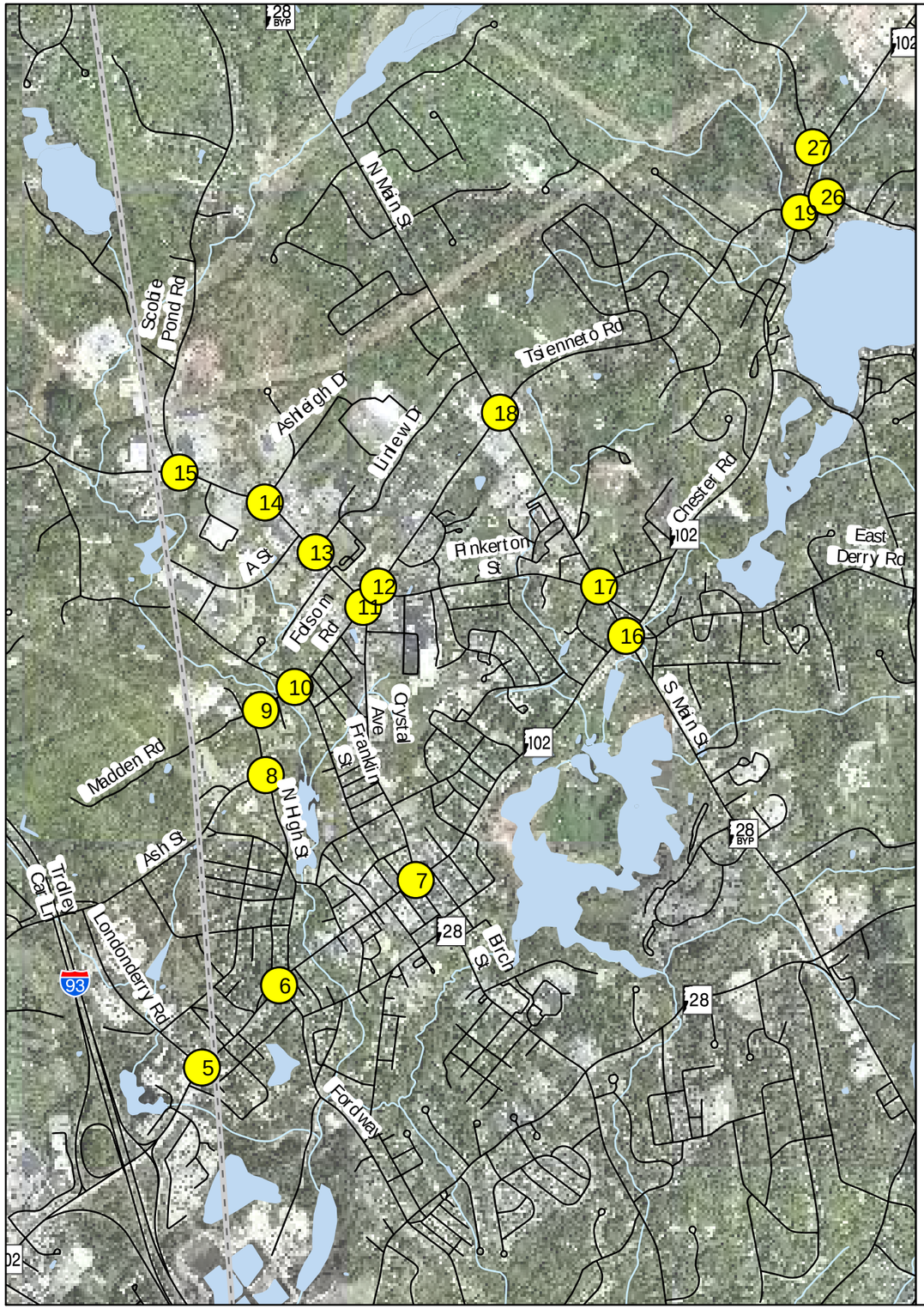
Sources:

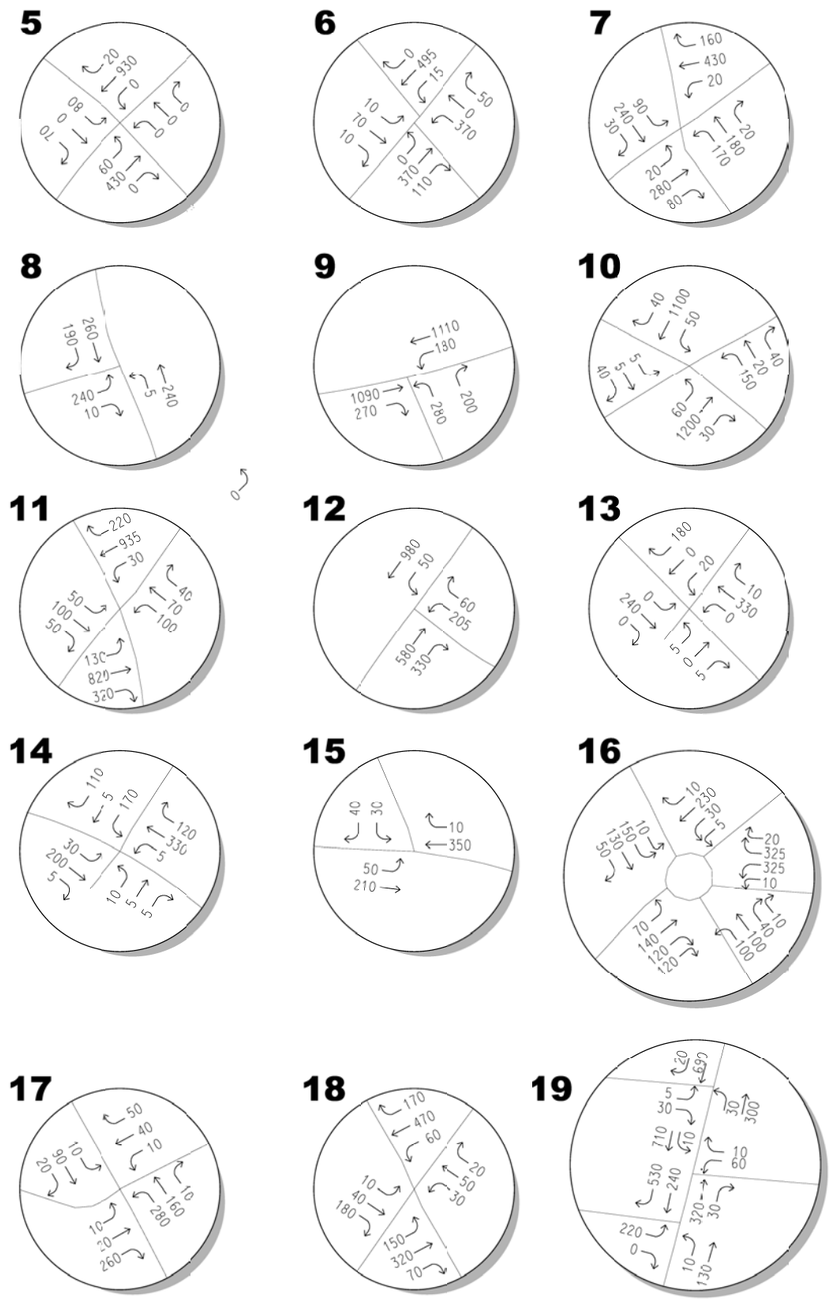
Coordinate System:
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 28 - 2040 No-Build PM Peak Hour Base Volumes – Locations 5-19 and 26-27





I-93 Exit 4A
Supplemental Draft EIS

2040 ALT A AM PEAK HOUR BASE VOLUMES

INDEX

5. NH 102/ Londonderry Road
6. NH 102/ Fordway/ High St.
7. NH 102/ NH 28
8. N. High St./ Ash St. Extension
9. N. High St./ Madden Rd.
10. N. High St./ Fdsom Rd./ Franklin St.
11. NH 28/ Fdsom Rd./ Tsienneto Rd.
12. Tsienneto Rd./ Pinkerton St.
13. NH 28/ Linlew Dr.
14. NH28/ Ashleigh Dr.
15. NH 28/ Scobie Pond Rd.
16. NH 102/ NH 28 Bypass/ E. Derry Rd.
17. NH 28 Bypass/ Pinkerton St.
18. NH 28 Bypass/ Tsienneto Rd.
19. NH 102/ Tsienneto Rd.
26. NH 102/ North Shore Rd.
27. NH 102/ English Range Rd.

Feet
0 1,000 2,000

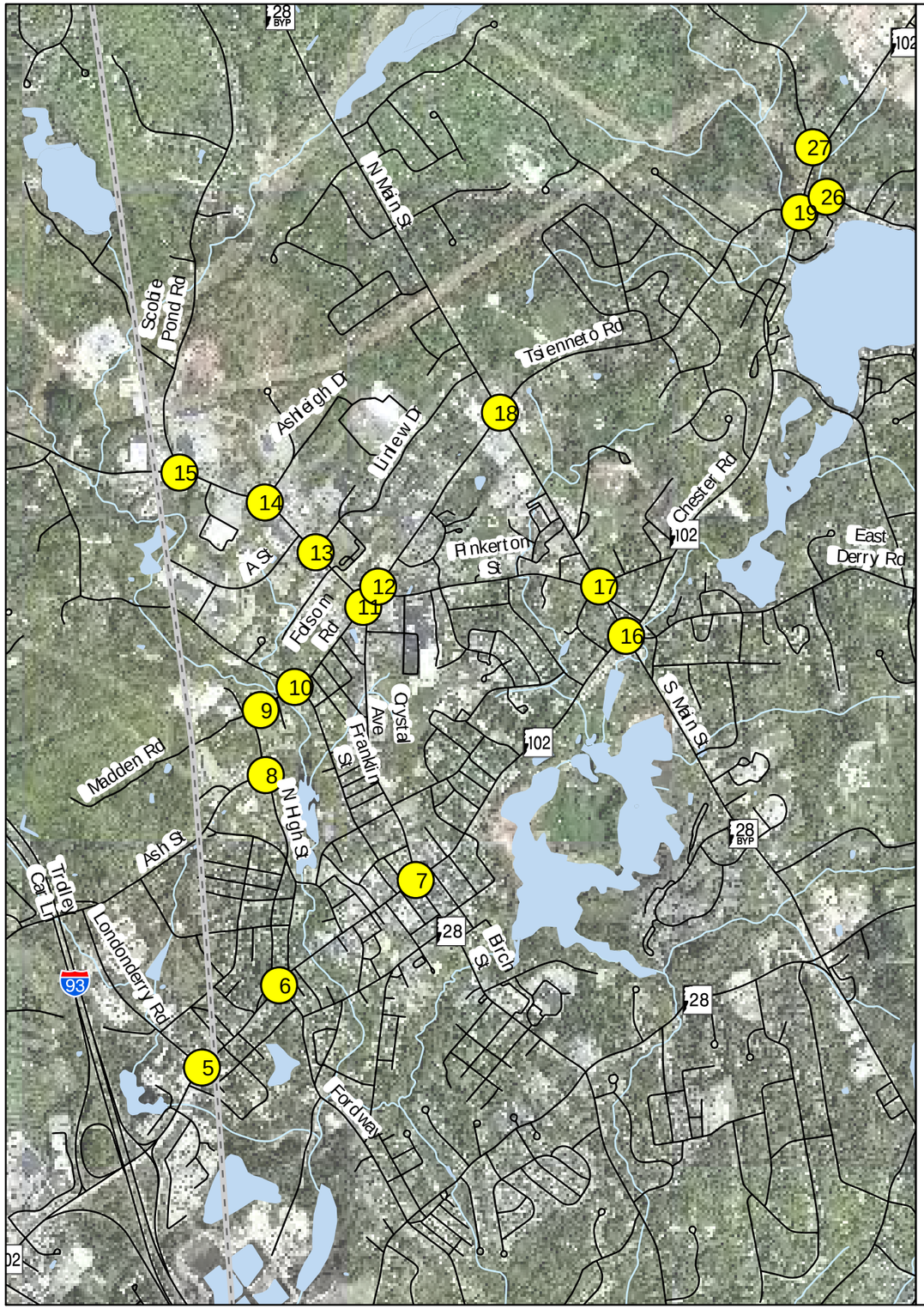
Sources:

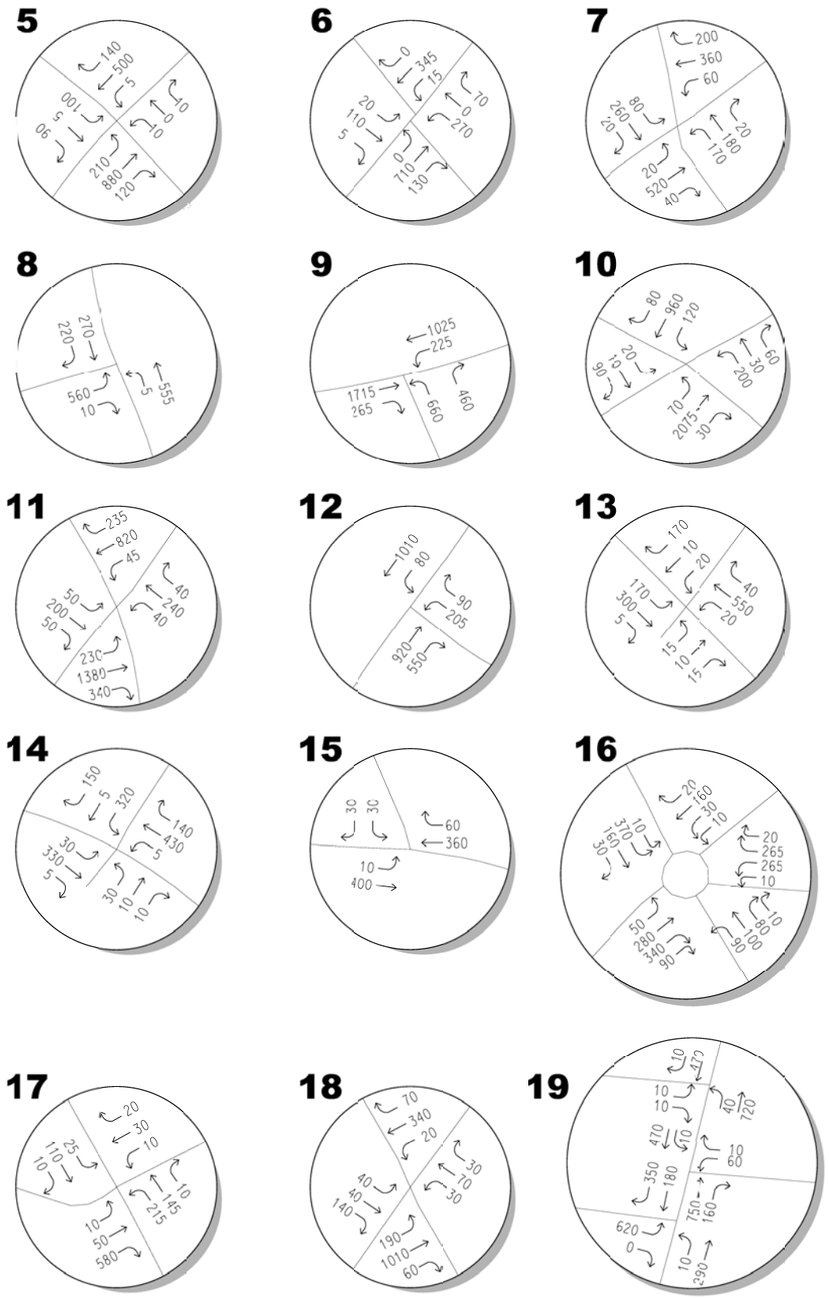
Coordinate System:
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 29 - 2040 Alternative A AM Peak Hour Base Volumes – Locations 5-19 and 26-27





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Supplemental Draft EIS

2040 ALT A PM PEAK HOUR BASE VOLUMES

INDEX

5. NH 102/ Londonderry Road
6. NH 102/ Fordway/ High St.
7. NH 102/ NH 28
8. N. High St./ Ash St. Extension
9. N. High St./ Madden Rd.
10. N. High St./ Fdsom Rd./ Franklin St.
11. NH 28/ Fdsom Rd./ Tsienneto Rd.
12. Tsienneto Rd./ Pinkerton St.
13. NH 28/ Linlew Dr.
14. NH28/ Ashleigh Dr.
15. NH 28/ Scobie Pond Rd.
16. NH 102/ NH 28 Bypass/ E. Derry Rd.
17. NH 28 Bypass/ Pinkerton St.
18. NH 28 Bypass/ Tsienneto Rd.
19. NH 102/ Tsienneto Rd.
26. NH 102/ North Shore Rd
27. NH 102/ English Range Rd

Feet
0 1,000 2,000

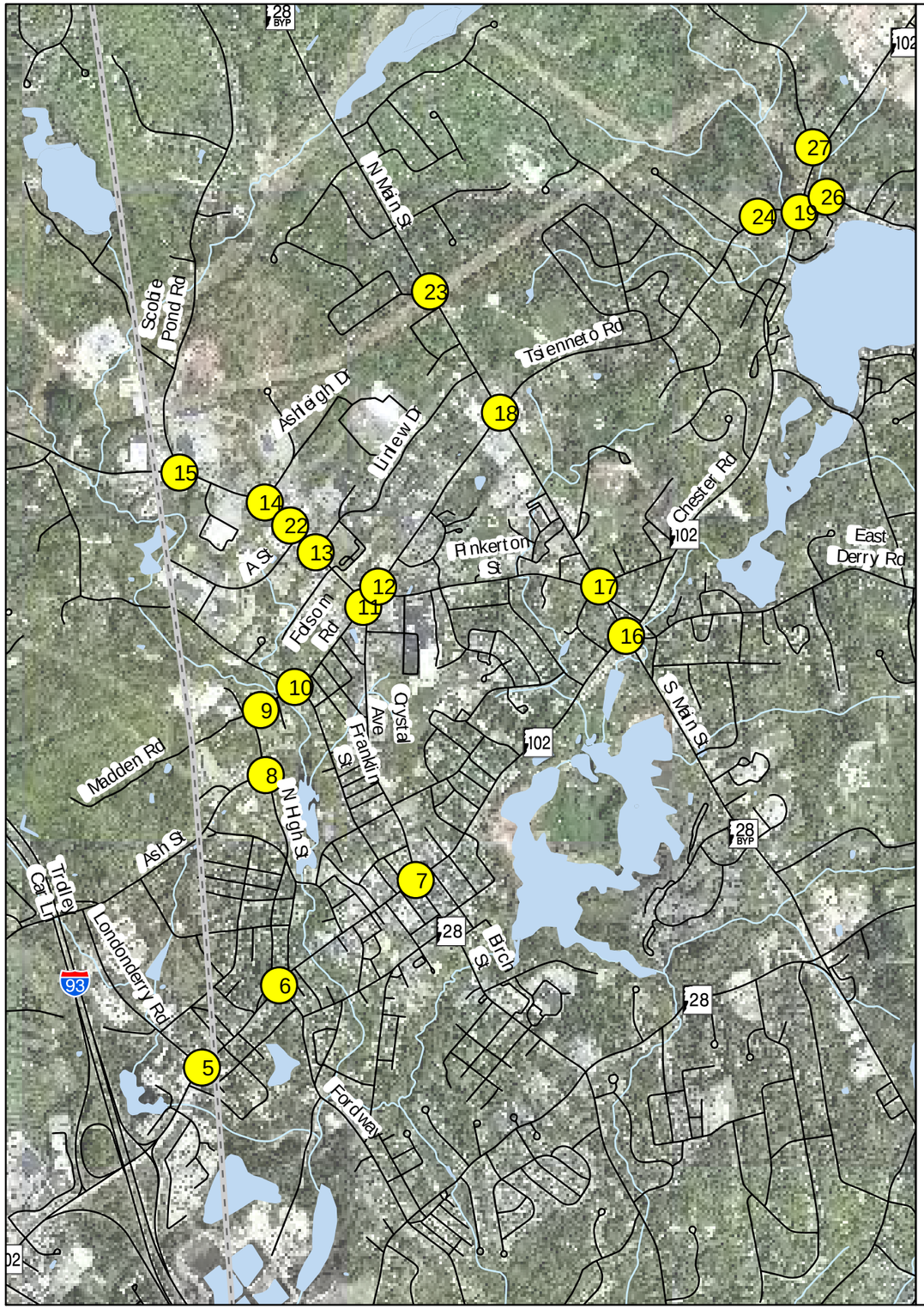
Sources:

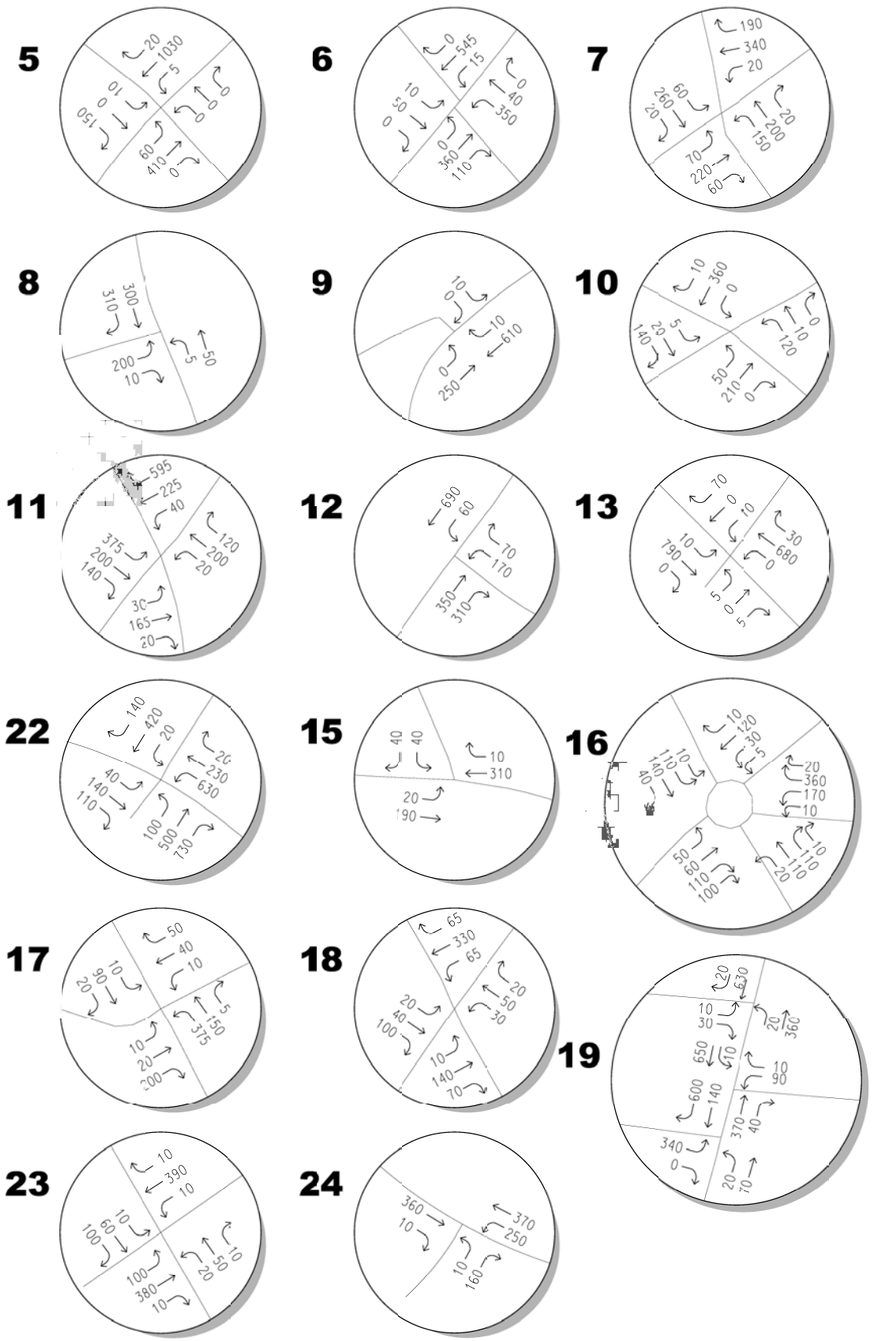
Coordinate System:
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 30 - 2040 Alternative A PM Peak Hour Base Volumes – Locations 5-19 and 26-27





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Supplemental Draft EIS

2040 ALT B AM PEAK HOUR BASE VOLUMES

INDEX

5. NH 102/ Londonderry Road
6. NH 102/ Fordway/ High St.
7. NH 102/ NH 28
8. N High St./ Ash St. Extension
9. N High St./ Madden Rd.
10. N High St./ Folsom Rd./ Franklin St.
11. NH 28/ Folsom Rd./ Tsienneto Rd.
12. Tsienneto Rd./ Pinkerton St.
13. NH 28/ Linlew Dr.
14. NH 28/ Ashleigh Dr.
15. NH 28/ Scobie Pond Rd.
16. NH 102/ NH 28 Bypass/ E. Derry Rd.
17. NH 28 Bypass/ Pinkerton St.
18. NH 28 Bypass/ Tsienneto Rd.
19. NH 102/ Tsienneto Rd.
22. NH 28/ B-C Connector
23. NH 28 Bypass/ B-C Connector
24. Tsienneto Rd/ B-C Connector
26. NH 102/ North Shore Rd
27. NH 102/ English Range Rd

Feet
0 1,000 2,000

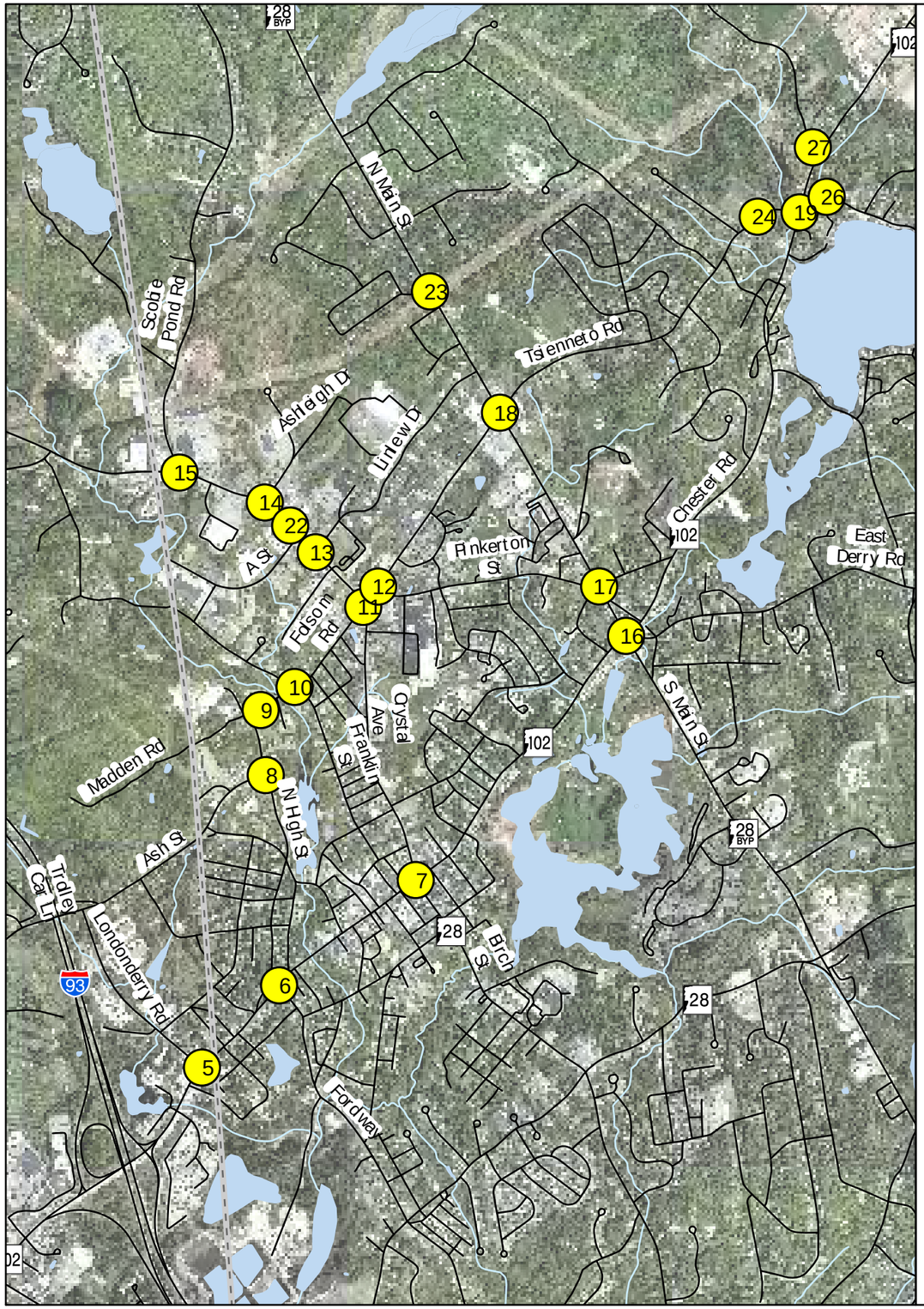
Sources:

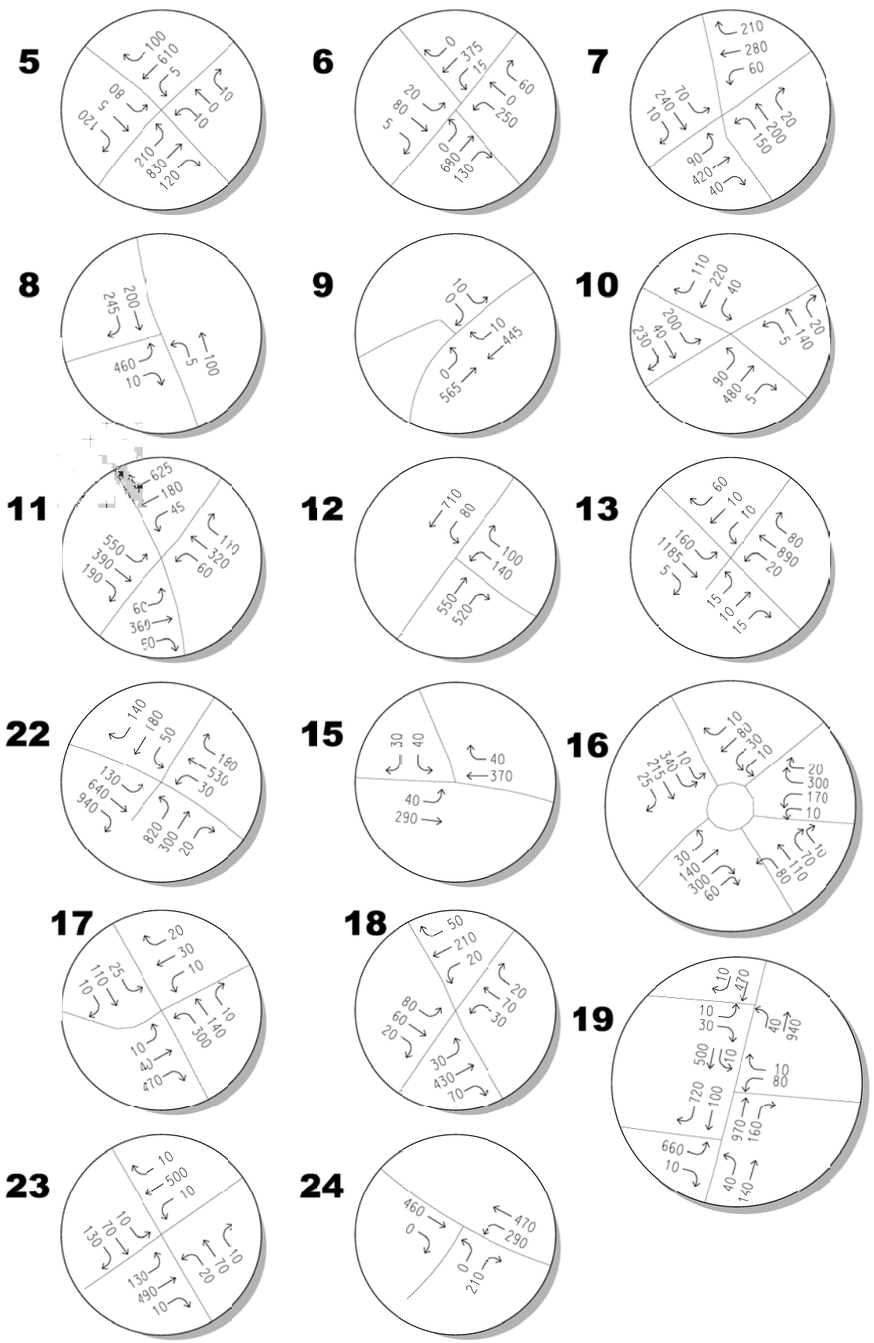
Coordinate System:
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 31 - 2040 Alternative B AM Peak Hour Base Volumes – Locations 5-19, 22-24, and 26-27





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Supplemental Draft EIS

2040 ALT B PM PEAK HOUR BASE VOLUMES

INDEX

5. NH 102/ Londonderry Road
6. NH 102/ Fordway/ High St.
7. NH 102/ NH 28
8. N High St./ Ash St. Extension
9. N High St./ Madden Rd.
10. N High St./ Fdsom Rd./ Franklin St.
11. NH 28/ Fdsom Rd./ Tsienneto Rd.
12. Tsienneto Rd./ Pinkerton St.
13. NH 28/ Linlew Dr.
14. NH 28/ Ashleigh Dr.
15. NH 28/ Scobie Pond Rd.
16. NH 102/ NH 28 Bypass/ E. Derry Rd.
17. NH 28 Bypass/ Pinkerton St.
18. NH 28 Bypass/ Tsienneto Rd.
19. NH 102/ Tsienneto Rd.
22. NH 28/ B-C Connector
23. NH 28 Bypass/ B-C Connector
24. Tsienneto Rd/ B-C Connector
26. NH 102/ North Shore Rd
27. NH 102/ English Range Rd

Feet
0 1,000 2,000

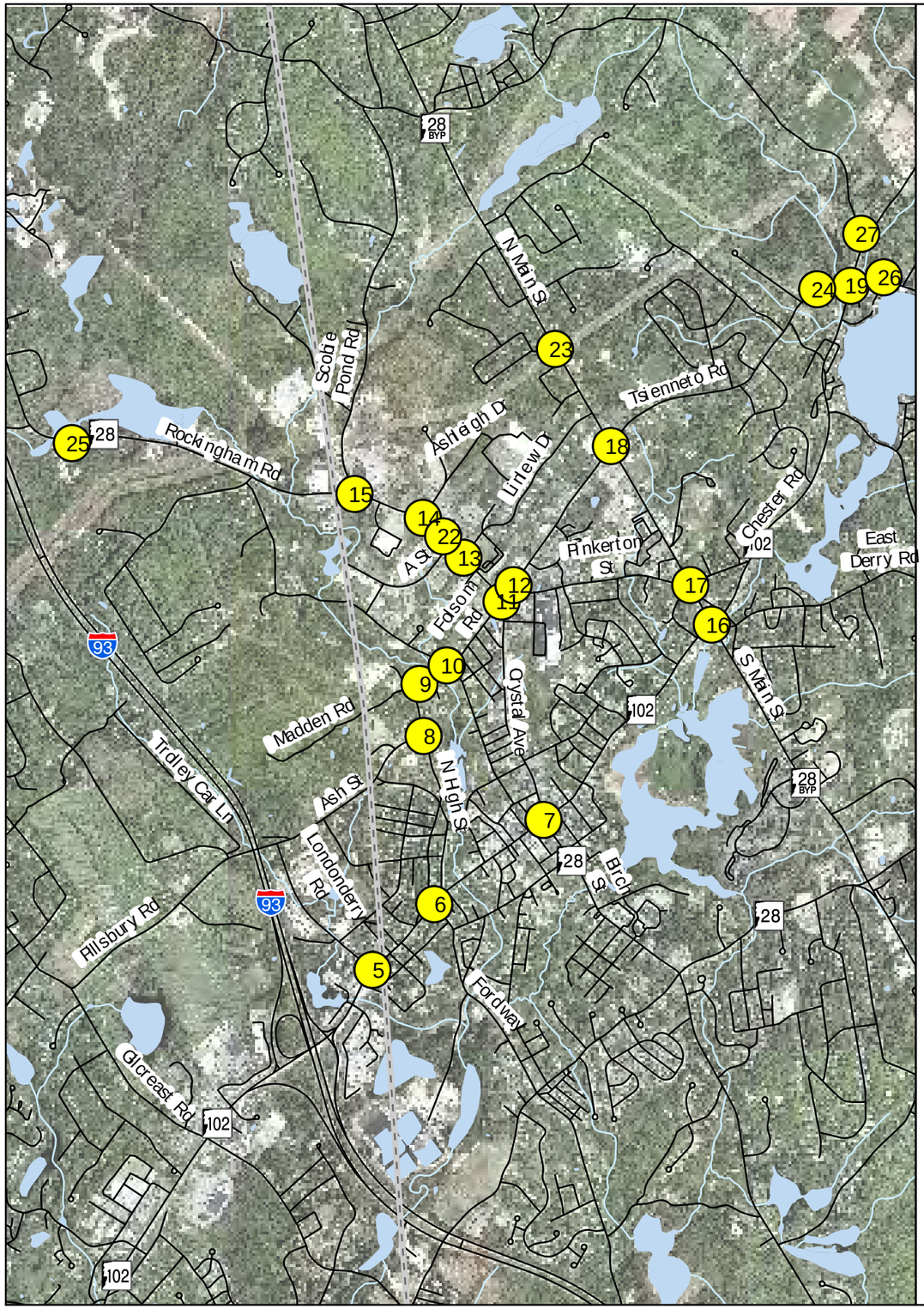
Sources:

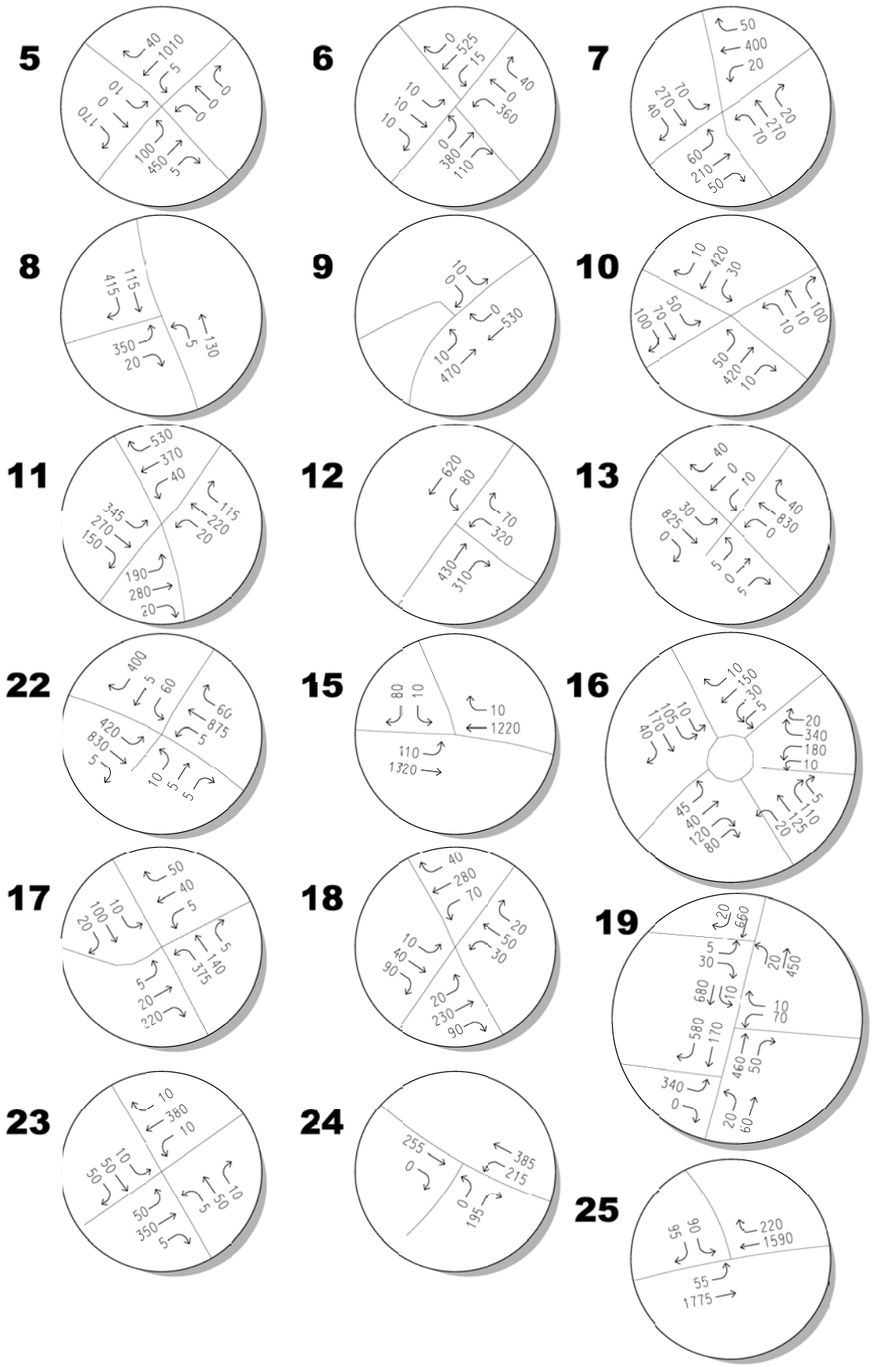
Coordinate System:
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 32 - 2040 Alternative B PM Peak Hour Base Volumes – Locations 5-19, 22-24, and 26-27





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Supplemental Draft EIS

2040 ALT C AM PEAK HOUR BASE VOLUMES

INDEX

5. NH 102/ Londonderry Road
6. NH 102/ Fordway/ High St.
7. NH 102/ NH 28
8. N High St./ Ash St. Extension
9. N High St./ Madden Rd.
10. N High St./ Fdsom Rd./ Franklin St.
11. NH 28/ Fdsom Rd./ Tsienneto Rd.
12. Tsienneto Rd./ Pinkerton St.
13. NH 28/ Linlew Dr.
14. NH 28/ Ashleigh Dr.
15. NH 28/ Scobie Pond Rd.
16. NH 102/ NH 28 Bypass/ E. Derry Rd.
17. NH 28 Bypass/ Pinkerton St.
18. NH 28 Bypass/ Tsienneto Rd.
19. NH 102/ Tsienneto Rd.
22. NH 28/ B-C Connector
23. NH 28 Bypass/ B-C Connector
24. Tsienneto Rd/ B-C Connector
25. NH 28/ C-D Connector
26. NH 102/ North Shore Rd
27. NH 102/ English Range Rd

Feet
0 1,000 2,000

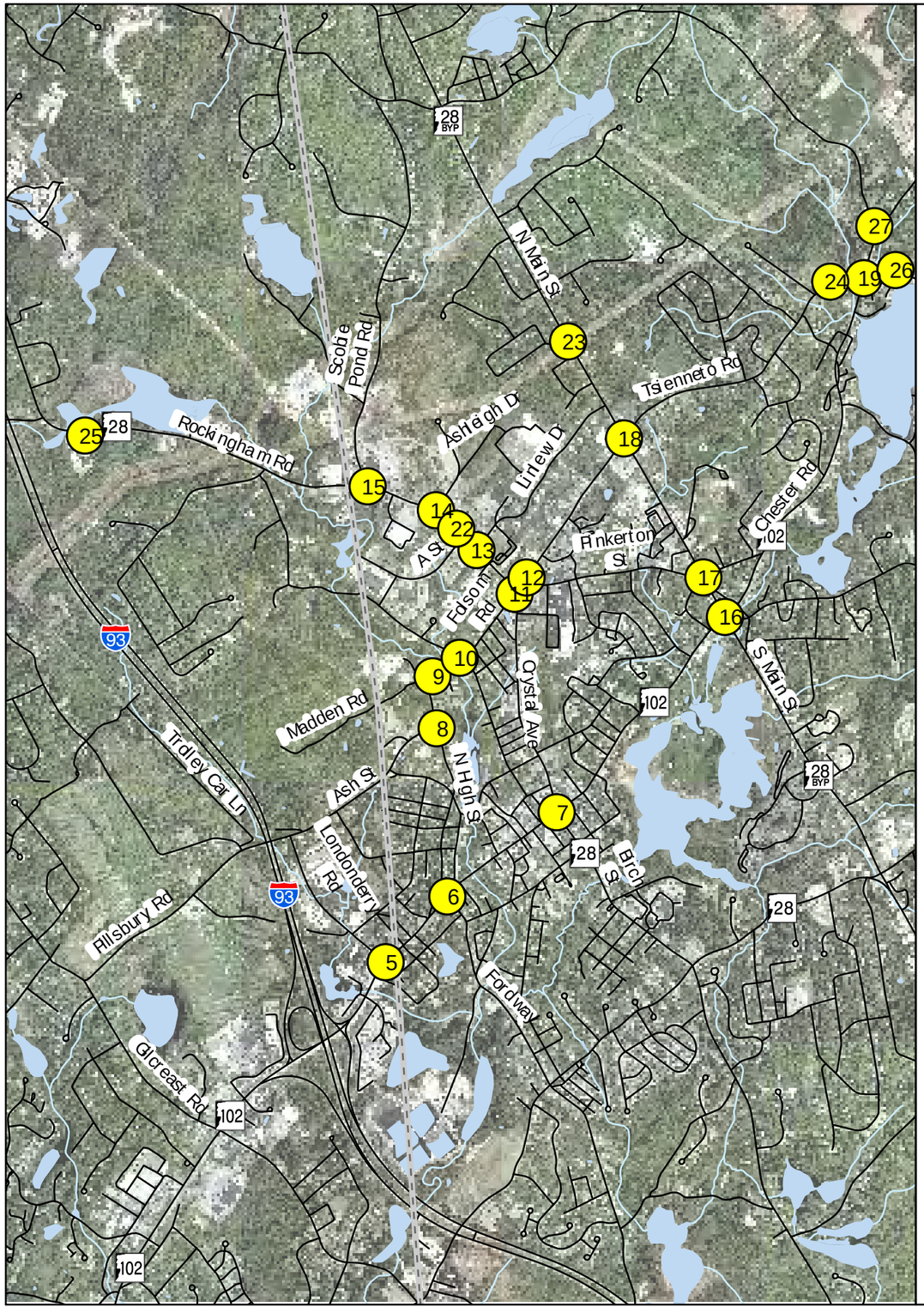
Sources:

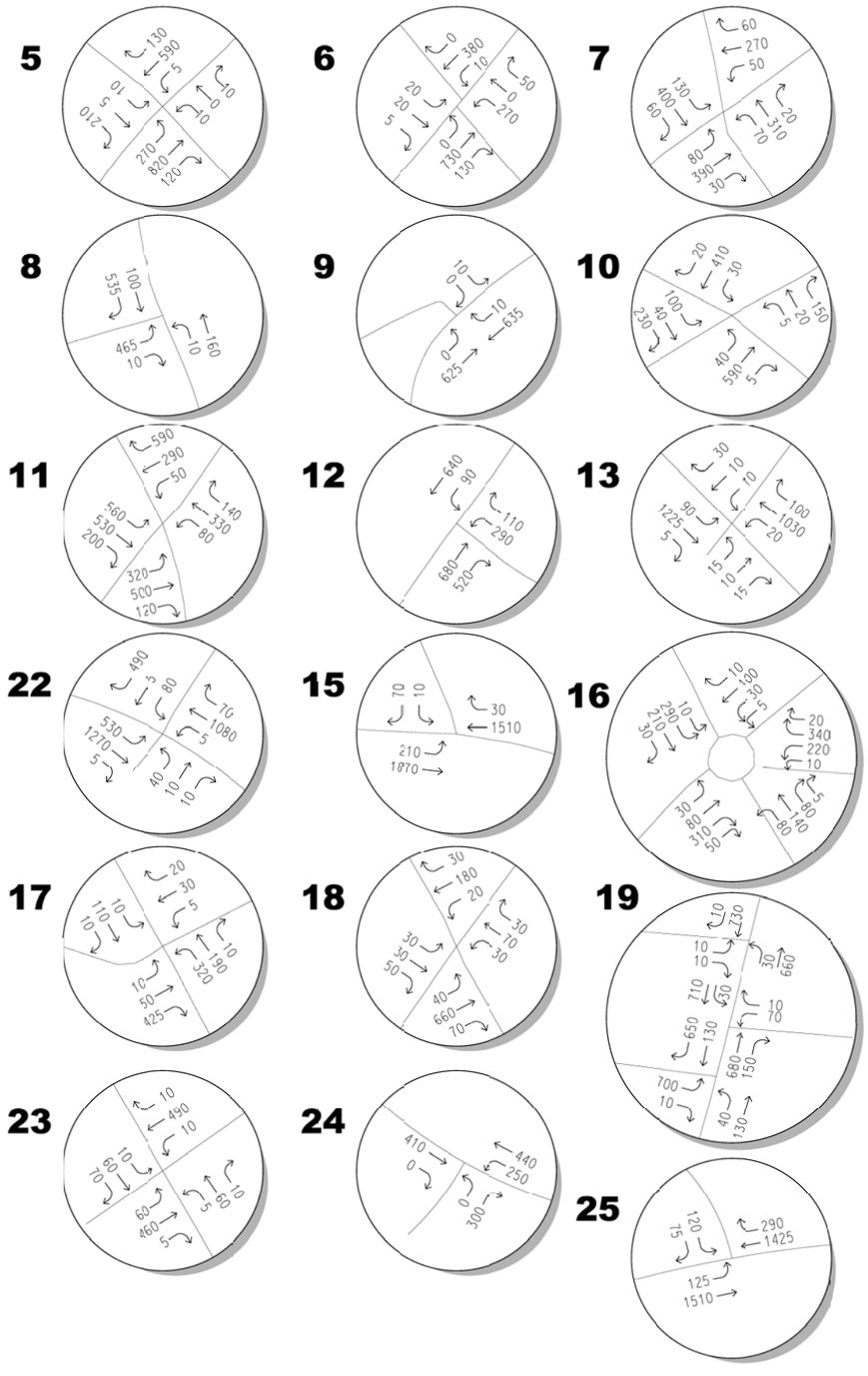
Coordinate System:
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 33 - 2040 Alternative C AM Peak Hour Base Volumes – Locations 5-19 and 22-27





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Supplemental Draft EIS

2040 ALT C PM PEAK HOUR BASE VOLUMES

INDEX

5. NH 102/ Londonderry Road
6. NH 102/ Fordway/ High St.
7. NH 102/ NH 28
8. N High St./ Ash St. Extension
9. N High St./ Madden Rd.
10. N High St./ Fdsom Rd./ Franklin St.
11. NH 28/ Fdsom Rd./ Tsienneto Rd.
12. Tsienneto Rd./ Pinkerton St.
13. NH 28/ Linlew Dr.
14. NH 28/ Ashleigh Dr.
15. NH 28/ Scobie Pond Rd.
16. NH 102/ NH 28 Bypass/ E. Derry Rd.
17. NH 28 Bypass/ Pinkerton St.
18. NH 28 Bypass/ Tsienneto Rd.
19. NH 102/ Tsienneto Rd.
22. NH 28/ B-C Connector
23. NH 28 Bypass/ B-C Connector
24. Tsienneto Rd/ B-C Connector
25. NH 28/ C-D Connector
26. NH 102/ North Shore Rd
27. NH 102/ English Range Rd

Feet
0 1,000 2,000

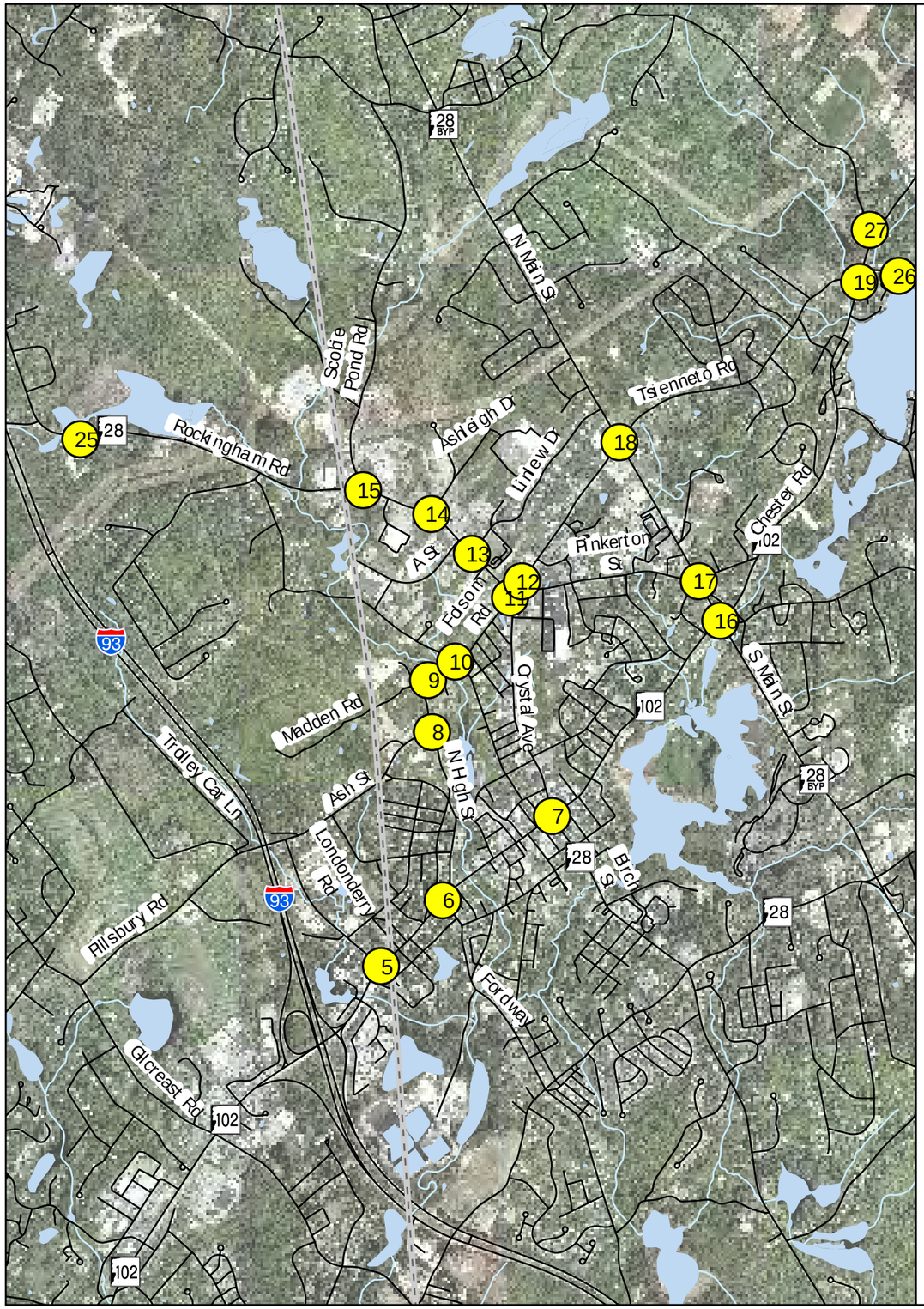
Sources:

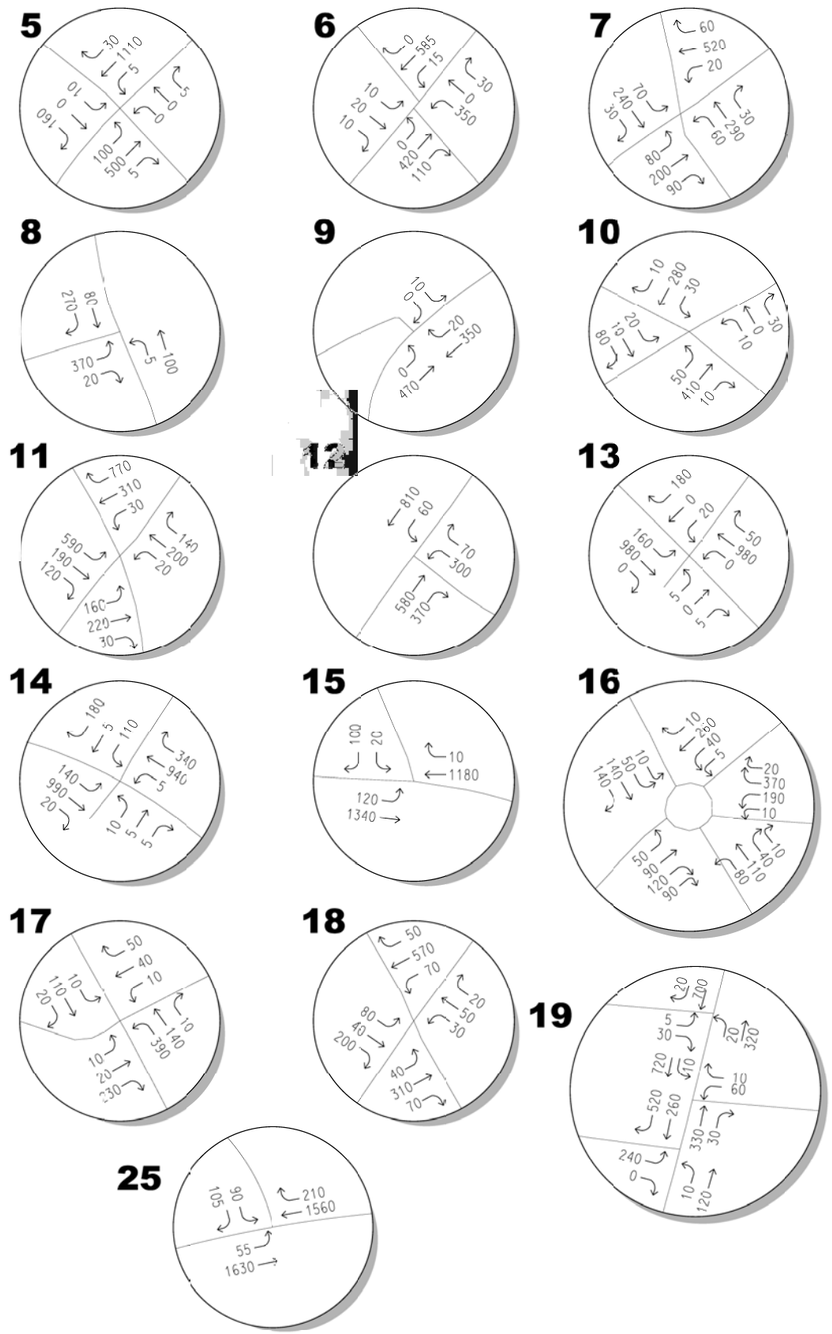
Coordinate System
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 34 - 2040 Alternative C PM Peak Hour Base Volumes – Locations 5-19 and 22-27





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Supplemental Draft EIS

2040 ALT D AM PEAK HOUR BASE VOLUMES

INDEX

5. NH 102/ Londonderry Road
6. NH 102/ Fordway/ High St.
7. NH 102/ NH 28
8. N. High St./ Ash St. Extension
9. N. High St./ Madden Rd.
10. N. High St./ Edsom Rd./ Franklin St.
11. NH 28/ Edsom Rd./ Tsienneto Rd.
12. Tsienneto Rd./ Pinkerton St.
13. NH 28/ Linlew Dr.
14. NH28/ Ashleigh Dr.
15. NH 28/ Scobie Pond Rd.
16. NH 102/ NH 28 Bypass/ E. Derry Rd.
17. NH 28 Bypass/ Pinkerton St.
18. NH 28 Bypass/ Tsienneto Rd.
19. NH 102/ Tsienneto Rd.
25. NH 28/ C-D Connector
26. NH 102/ North Shore Rd
27. NH 102/ English Range Rd

Feet
0 1,000 2,000

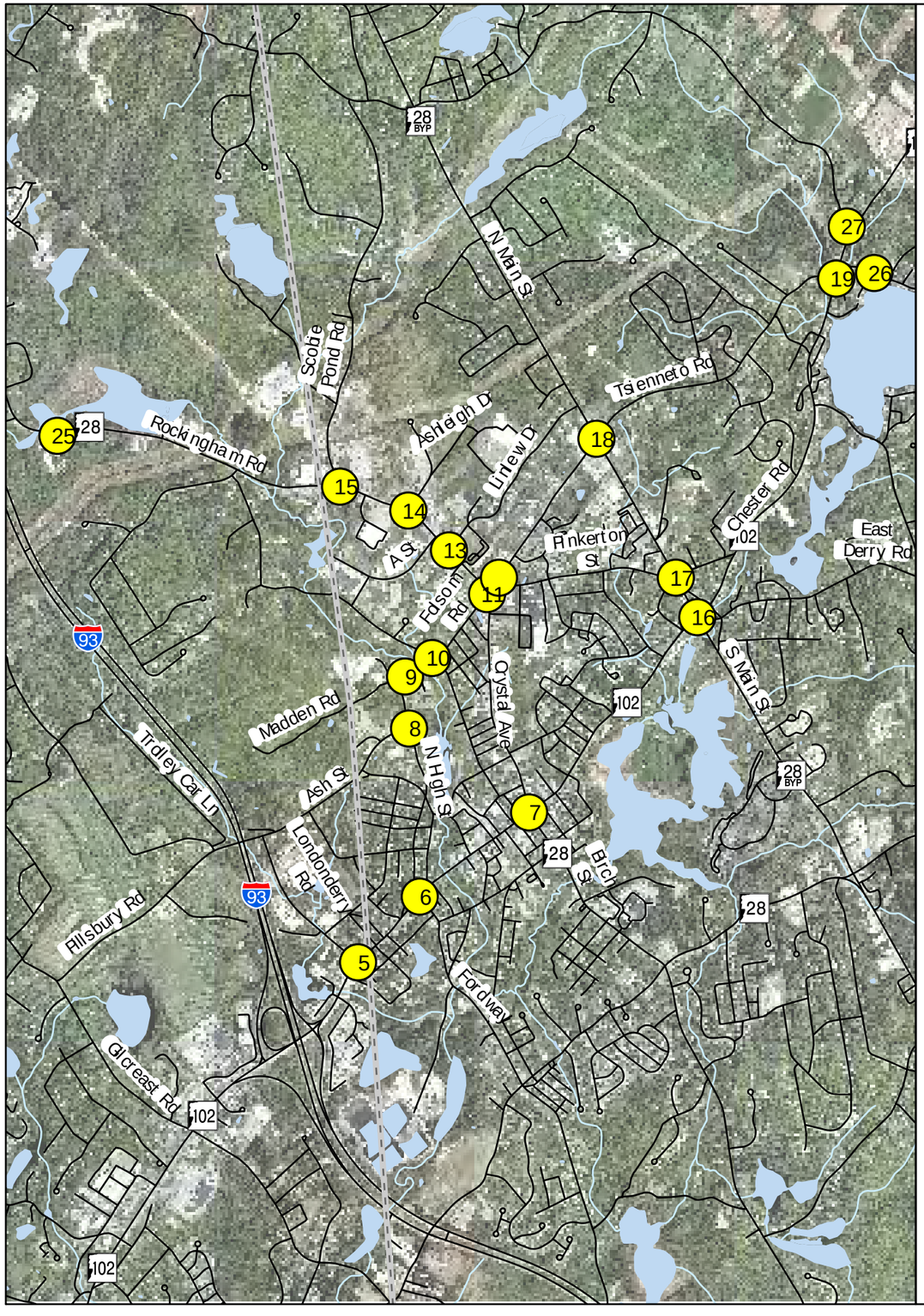
Sources:

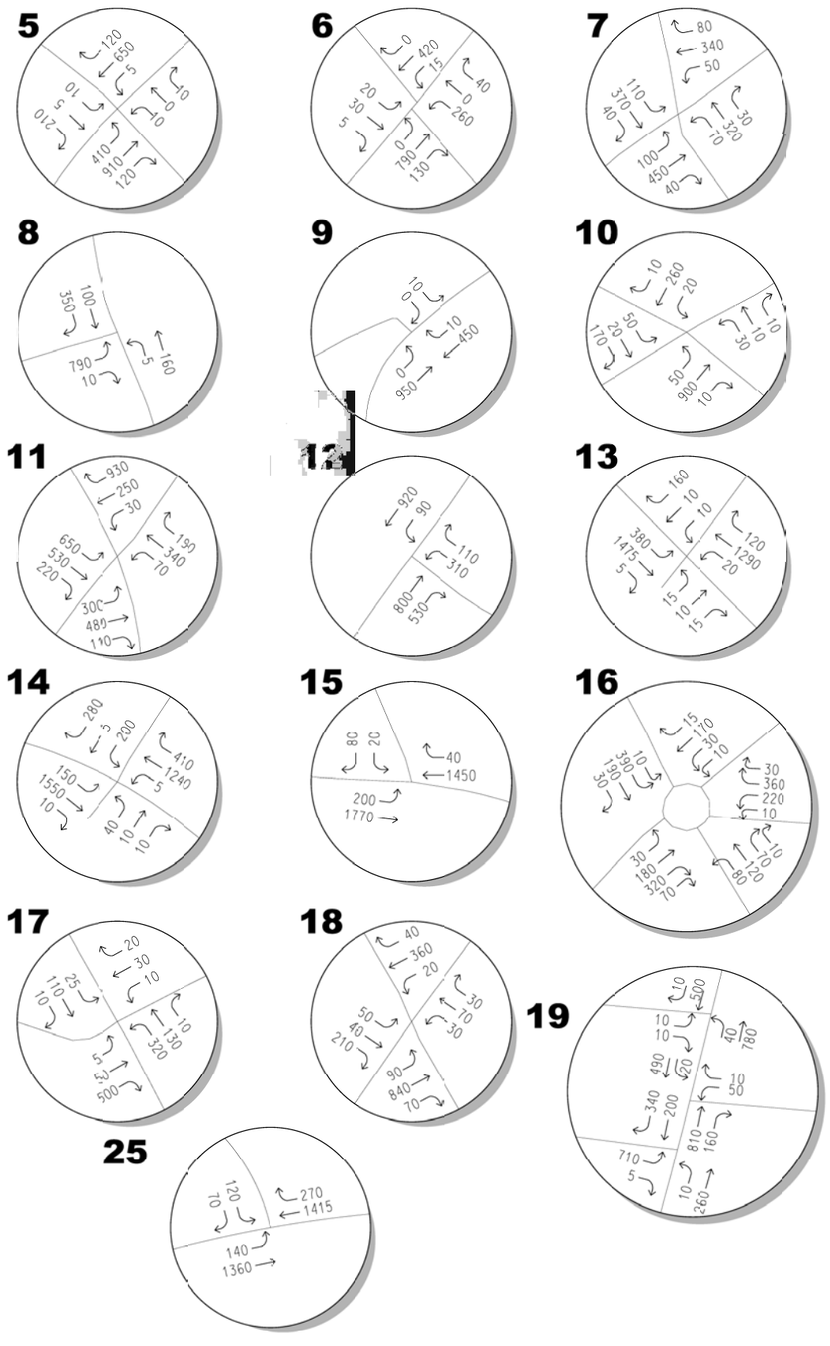
Coordinate System
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 35 - 2040 Alternative D AM Peak Hour Base Volumes – Locations 5-19 and 25-27





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2040 ALT D PM PEAK HOUR BASE VOLUMES

INDEX

5. NH 102/ Londonderry Road
6. NH 102/ Fordway/ High St.
7. NH 102/ NH 28
8. N High St./ Ash St. Extension
9. N High St./ Madden Rd.
10. N High St./ Fdsom Rd./ Franklin St.
11. NH 28/ Fdsom Rd./ Tsienneto Rd.
12. Tsienneto Rd./ Pinkerton St.
13. NH 28/ Linlew Dr.
14. NH28/ Ashleigh Dr.
15. NH 28/ Scobie Pond Rd.
16. NH 102/ NH 28 Bypass/ E. Derry Rd.
17. NH 28 Bypass/ Pinkerton St.
18. NH 28 Bypass/ Tsienneto Rd.
19. NH 102/ Tsienneto Rd.
25. NH 28/ C-D Connector
26. NH 102/ North Shore Rd
27. NH 102/ English Range Rd

Feet
0 1,000 2,000

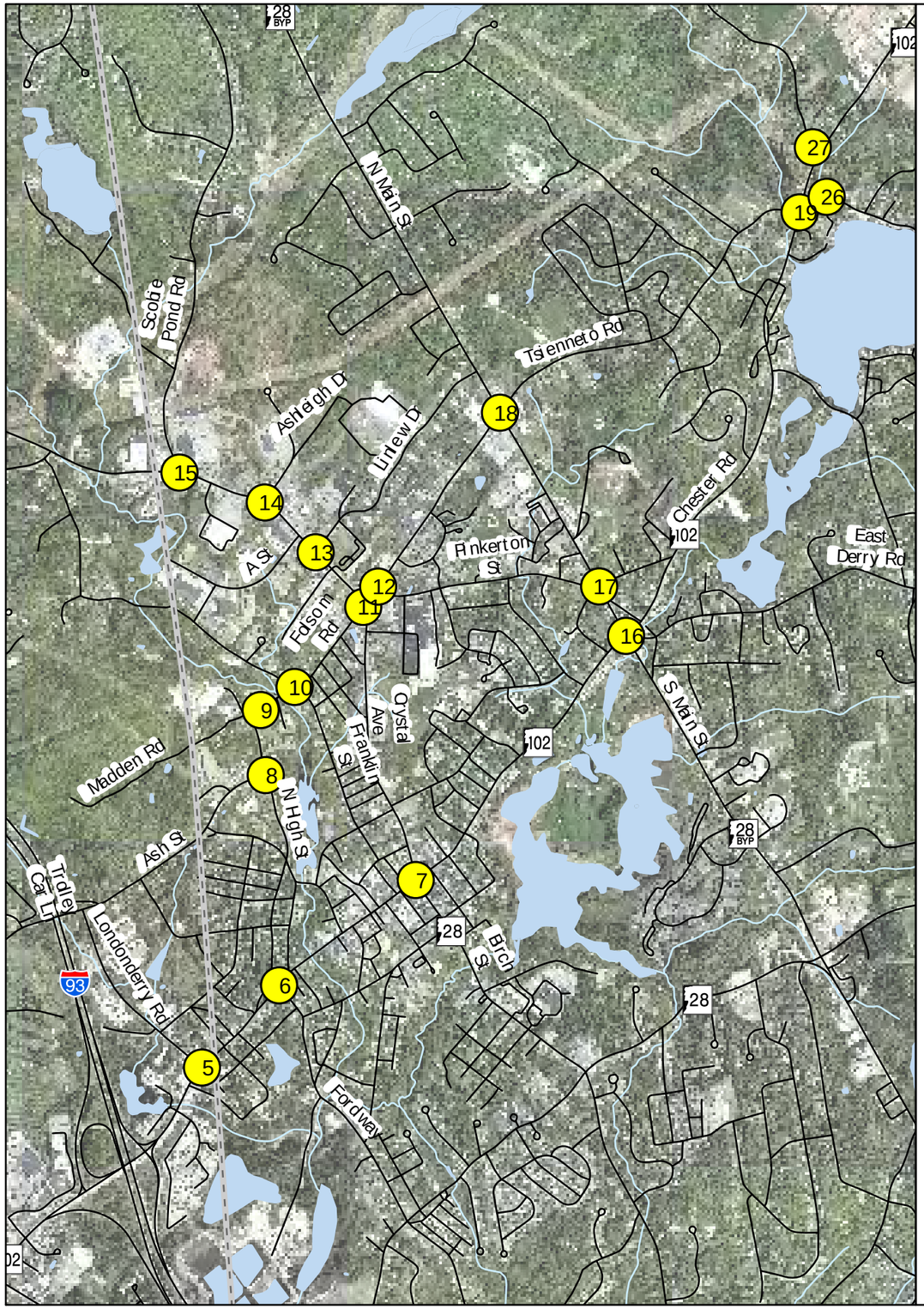
Sources:

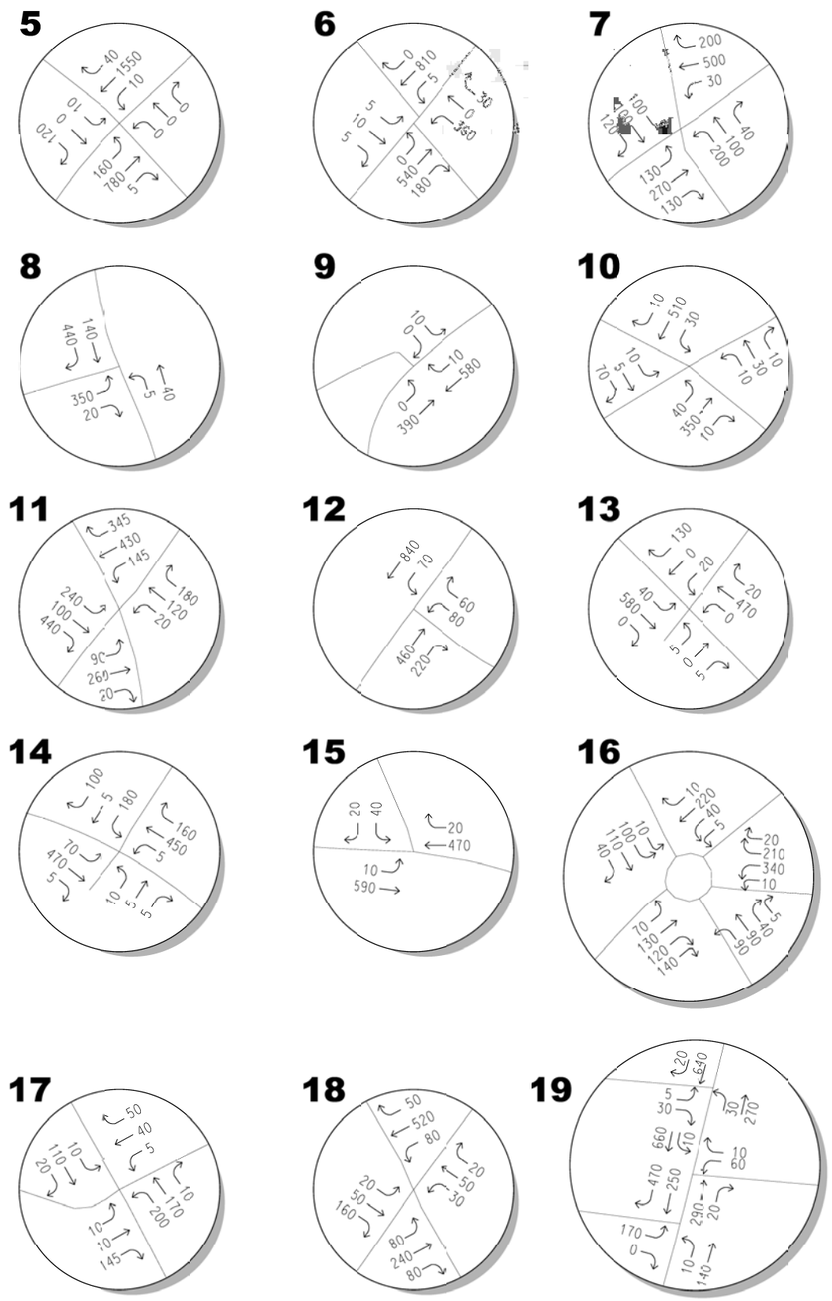
Coordinate System
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 36 - 2040 Alternative D PM Peak Hour Base Volumes – Locations 5-19 and 25-27





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Supplemental Draft EIS

2040 ALT F AM PEAK HOUR BASE VOLUMES

INDEX

5. NH 102/ Londonderry Road
6. NH 102/ Fordway/ High St.
7. NH 102/ NH 28
8. N. High St./ Ash St. Extension
9. N. High St./ Madden Rd.
10. N. High St./ Fdsom Rd./ Franklin St.
11. NH 28/ Fdsom Rd./ Tsienneto Rd.
12. Tsienneto Rd./ Pinkerton St.
13. NH 28/ Linlew Dr.
14. NH28/ Ashleigh Dr.
15. NH 28/ Scobie Pond Rd.
16. NH 102/ NH 28 Bypass/ E. Derry Rd.
17. NH 28 Bypass/ Pinkerton St.
18. NH 28 Bypass/ Tsienneto Rd.
19. NH 102/ Tsienneto Rd.
26. NH 102/ North Shore Rd
27. NH 102/ English Range Rd

Feet
0 1,000 2,000

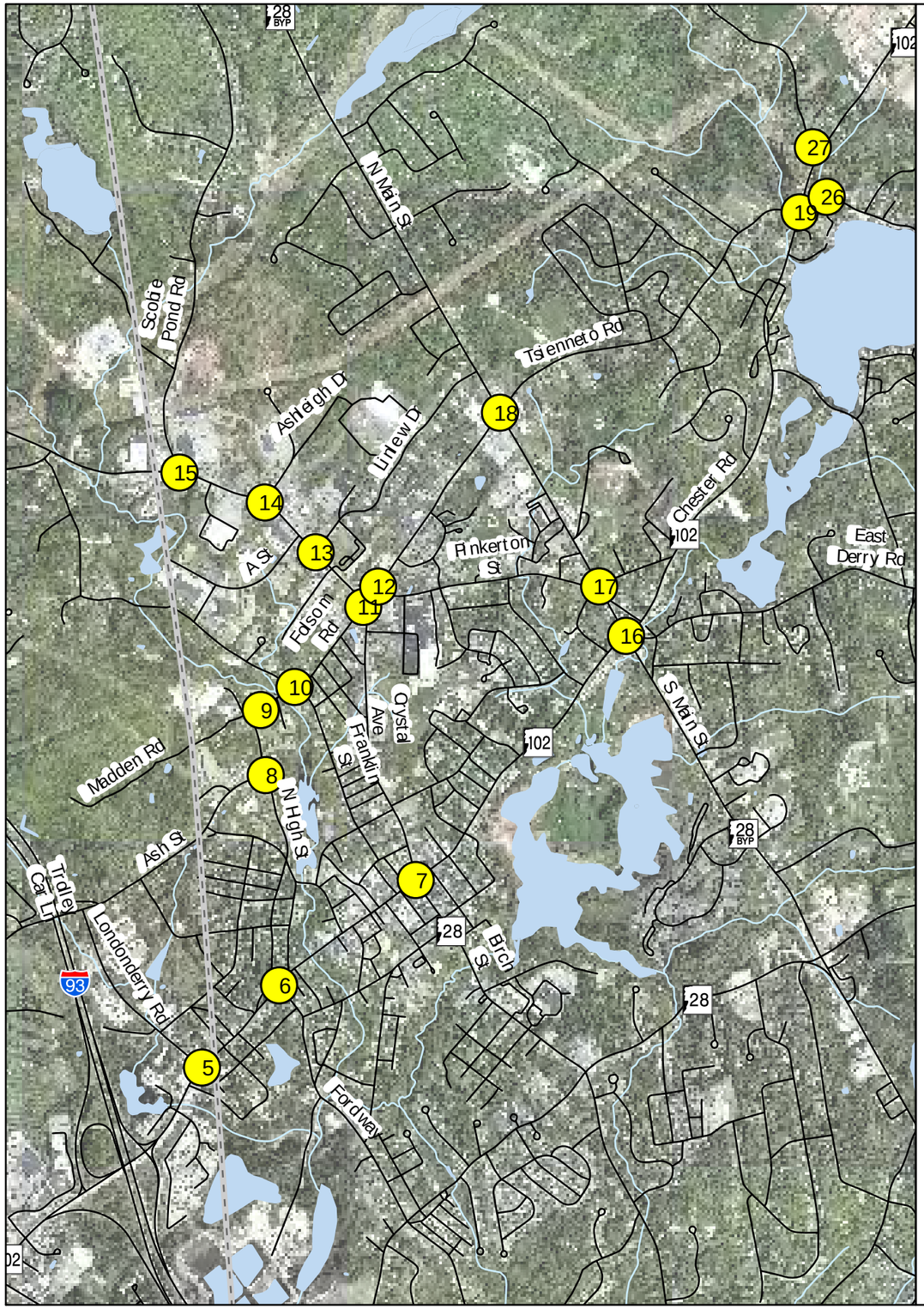
Sources:

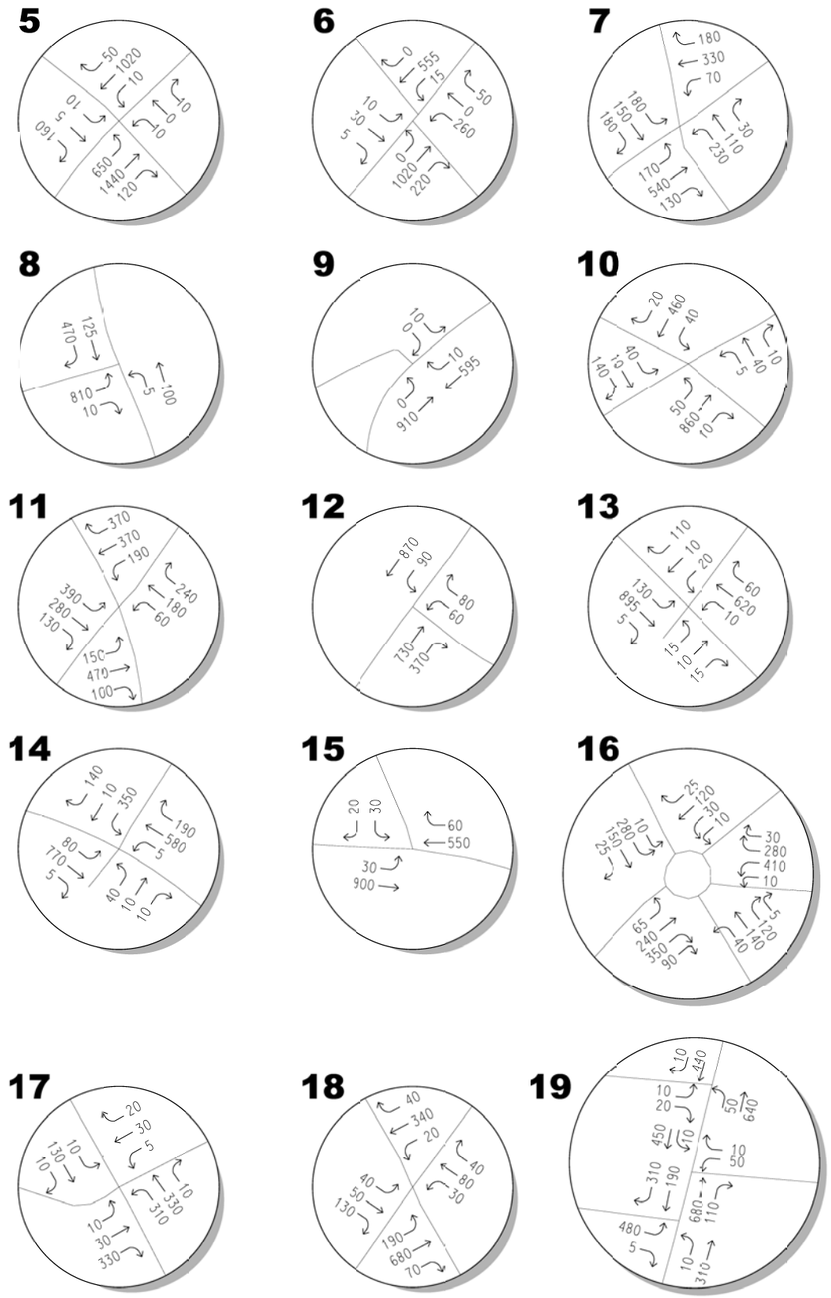
Coordinate System:
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 37 - 2040 Alternative F AM Peak Hour Base Volumes – Locations 5-19 and 26-27





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2040 ALT F PM PEAK HOUR BASE VOLUMES

INDEX

5. NH 102/ Londonderry Road
6. NH 102/ Fordway/ High St.
7. NH 102/ NH 28
8. N. High St./ Ash St. Extension
9. N. High St./ Madden Rd.
10. N. High St./ Fdsom Rd./ Franklin St.
11. NH 28/ Fdsom Rd./ Tsienneto Rd.
12. Tsienneto Rd./ Pinkerton St.
13. NH 28/ Linlew Dr.
14. NH28/ Ashleigh Dr.
15. NH 28/ Scobie Pond Rd.
16. NH 102/ NH 28 Bypass/ E. Derry Rd.
17. NH 28 Bypass/ Pinkerton St.
18. NH 28 Bypass/ Tsienneto Rd.
19. NH 102/ Tsienneto Rd.
26. NH 102/ North Shore Rd
27. NH 102/ English Range Rd

Feet
0 1,000 2,000

Sources:

Coordinate System:
NAD 1983 StatePlane
New Hampshire (feet)

Date:
January 24, 2018

New Hampshire DOT
Department of Transportation

Figure 38 - 2040 Alternative F PM Peak Hour Base Volumes – Locations 5-19 and 26-27

APPENDIX A: TRAFFIC COUNT DATA

NHDOT PERMANENT RECORDER COUNTS - I93 S OF EXIT 4 - MAY 2016

489003

WINDHAM I-93 **NB** AT BETWEEN EXITS 3-4 (02489002)

MN	DY	D	H1	H2	H3	H4	H5	H6	H7	**7-8 AM**	H9	H10	H11	H12	H13	H14	H15	H16	H17	**5-6 PM**	H19	H20	H21	H22	H23	H24	txtTotal
5	1	1	581	372	205	150	153	198	352	637	1171	1368	1826	2164	2335	2287	2153	2245	2267	2067	1912	1485	1104	818	576	465	29083
5	8	1	376	354	162	129	113	155	333	618	960	1388	2012	2313	2571	2401	2364	2507	2493	2351	2303	1827	1482	976	641	416	31245
5	2	2	419	209	142	125	262	639	1397	2230	1878	1540	1623	1898	1760	1959	2480	2889	3376	3611	2448	1582	1084	901	610	466	35330
5	9	2	240	151	111	122	267	689	1476	2290	1979	1600	1629	1588	1911	1840	2459	3280	3642	3628	2578	1714	1314	982	686	581	36757
5	3	3	270	182	174	141	227	619	1402	2192	1908	1596	1512	1659	1740	1911	2689	3249	3802	3537	2577	1721	1250	1050	682	503	36593
5	10	3	343	181	139	140	247	653	1468	2292	1923	1705	1724	1684	1795	1971	2615	3315	3788	3699	2737	1851	1364	1068	795	761	38258
5	4	4	268	199	161	151	268	609	1444	2281	1952	1556	1393	1814	1890	1952	2742	3329	3406	3540	2727	1827	1434	1178	827	524	37272
5	5	5	338	209	156	156	283	607	1357	2205	1989	1704	1623	1709	1828	1455	3061	3254	3585	3845	2755	2119	1388	1182	818	622	38048
5	6	6	393	281	173	166	290	625	1408	2230	1941	1669	1821	2177	2282	2564	3228	3665	3833	3546	3004	2252	1573	1413	1066	894	42494
5	7	7	476	295	191	151	146	351	800	1314	1949	2290	2445	2538	2674	2710	2862	2744	2555	2368	2059	1708	1393	1251	1031	759	37060
ADT-sum			3704	2433	1614	1431	2256	5137	11437	18489	17650	16416	17608	19344	20786	21050	26653	30477	32747	32012	25100	18086	13385	10819	7532	5993	362160
ADT			370	243	161	143	226	514	1144	1849	1765	1642	1761	1934	2079	2105	2665	3048	3275	3201	2510	1809	1339	1082	753	599	36216
AWDT-sum			2271	1412	1056	1001	1844	4441	9952	15720	13570	11370	11325	12329	13206	13652	19274	22981	25432	25206	18826	13066	9407	7774	5284	4353	264752
AWDT			324	202	151	143	263	634	1422	**2246**	1939	1624	1618	1761	1887	1950	2753	3283	3633	**3601**	2689	1867	1344	1111	755	622	37822

WINDHAM I-93 **SB** BETWEEN EXITS 3-4 (02489002)

MN	DY	D	H1	H2	H3	H4	H5	H6	H7	**7-8 AM**	H9	H10	H11	H12	H13	H14	H15	H16	H17	**5-6 PM**	H19	H20	H21	H22	H23	H24	txtTotal
5	1	1	309	243	155	104	172	358	595	930	1240	1692	2299	2623	2726	2805	2662	2645	2747	2286	1895	1478	1077	748	475	269	32524
5	8	1	331	210	131	105	124	325	512	813	1301	1932	2745	3127	3201	2936	2809	2676	2724	2433	2106	1726	1281	929	580	268	35325
5	2	2	150	138	187	291	1012	2537	3092	3145	3007	2358	1619	1853	1731	1681	1768	1868	2022	2202	1388	924	784	623	420	254	35072
5	9	2	174	104	155	285	1050	2682	3407	3344	2974	2377	1757	1879	1736	1615	1989	2106	2200	2461	1550	1079	872	688	481	246	37211
5	3	3	173	118	171	269	1018	2533	3245	3358	3209	2213	1753	1752	1730	1551	1930	2090	2178	2449	1621	1104	902	683	437	242	36729
5	10	3	166	135	162	271	1043	2756	3373	3456	3130	2350	1731	1788	1760	1732	1994	2263	2410	2530	1550	1222	899	776	514	277	38288
5	4	4	203	139	158	255	1028	2633	3317	3452	3005	2288	1730	1714	1765	1783	1930	2184	1792	2701	1623	1158	881	731	498	282	37250
5	5	5	191	143	171	259	973	2576	3109	3107	3009	2412	1625	1942	1784	1667	2264	2244	2332	2523	1688	1178	933	862	551	321	37864
5	6	6	202	170	213	289	950	2489	3110	3387	2795	2201	1834	2012	2002	2098	2356	2501	2485	2717	2025	1468	1077	984	741	432	40538
5	7	7	255	177	133	161	314	713	1044	1426	1877	2178	2339	2615	2582	2480	2555	2756	2780	2563	2109	1667	1283	1002	787	565	36361
ADT-sum			2156	1577	1636	2289	7684	19602	24804	26418	25547	21999	19432	21303	21017	20348	22257	23353	23670	24865	17555	13004	9989	8026	5484	3147	367162
ADT			216	158	164	229	768	1960	2480	2642	2555	2200	1943	2130	2102	2035	2226	2335	2367	2487	1756	1300	999	803	548	315	36716
AWDT-sum			1261	947	1217	1919	7074	18206	22653	23249	21129	16197	12049	12938	12508	12127	14231	15276	15419	17583	11445	8133	6348	5347	3642	2054	262952
AWDT			180	135	174	274	1011	2601	3236	**3321**	3018	2314	1721	1848	1787	1732	2033	2182	2203	**2512**	1635	1162	907	764	520	293	37565

AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF MAY 2015

WINDHAM- I-93 BETWEEN EXITS 3-4 (SB-NB) (01489004-01489003)

MN	DY	D	H1	H2	H3	H4	H5	H6	H7	7-8 AM	H9	H10	H11	H12	H13	H14	H15	H16	H17	5-6 PM	H19	H20	H21	H22	H23	H24	txtTotal	
5	3	1	811	930	462	287	275	453	986	1562	2248	2717	3696	4386	4853	4741	4578	4844	4780	4556	4168	3196	2542	1797	1267	746	80736	
5	10	1	813	569	286	194	233	421	786	1260	2153	3222	4819	5390	5538	5127	4937	4800	5131	5222	4324	3955	3168	2238	1341	737	66541	
5	17	1	908	573	289	253	295	488	1022	1832	2389	3414	4226	4804	5275	5095	4623	4776	4871	5013	4585	3776	3002	2184	1460	868	65703	
5	24	1	816	511	289	195	254	448	878	1441	2139	3085	4215	4733	4638	4612	4203	3995	4055	4280	3936	3683	3107	2589	1914	1140	61053	
5	31	1	684	645	355	233	234	414	818	1272	1877	2647	3650	4554	4893	4263	4228	4572	4555	4090	3589	2890	2197	1649	1238	743	56226	
5	2	7	948	587	391	301	429	945	1598	2354	3231	3783	4136	5108	4728	4693	4746	4747	4823	4511	3433	3746	2668	2508	1894	1419	67620	
5	9	7	800	584	375	284	479	949	1664	2713	3923	4428	4713	5095	5499	5196	5171	5355	5239	4956	4481	3507	3024	2564	2065	1382	74249	
5	16	7	836	588	436	321	466	997	1778	2660	3492	3975	4487	4968	5099	5057	4840	4917	4613	4520	3865	3119	2494	2086	1610	1203	68899	
5	23	7	844	558	354	286	412	853	1671	2643	3922	4686	5143	5226	5227	4886	4838	4755	4648	4256	3809	3078	2582	2246	2013	1481	70475	
5	30	7	858	562	400	321	456	1046	1700	2556	3425	4258	4717	4819	4894	4689	4525	4576	4486	4216	3541	2978	2588	2379	2011	1291	67314	
5	25	2	648	390	217	182	287	521	850	1189	1763	2614	3447	4365	4905	4683	4476	4560	4489	4083	3234	3431	2947	2353	1429	769	58491	Holiday
5	4	2	598	448	258	340	867	2857	4273	5577	5161	3765	3258	3283	3347	3276	4138	4922	5486	5635	4340	2851	2106	1686	1167	824	70471	
5	11	2	424	389	280	327	899	2886	4351	5535	5326	3856	3614	3491	3552	3645	4186	5050	5536	5865	4629	3147	2248	1829	1383	956	72954	
5	18	2	479	348	278	344	868	2925	4372	5684	5150	4059	3623	3721	3899	3762	4426	5052	5437	5932	4648	3344	2259	1858	1482	822	74446	
5	5	3	511	396	265	331	825	2761	4372	5623	5151	3898	3324	3401	3201	3580	4284	4857	5545	6022	4587	2972	2262	1902	1373	951	72346	
5	12	3	483	347	299	353	899	2926	4279	5688	5148	3789	3302	3443	3353	3651	4264	4841	5506	5588	4730	3284	2293	1926	1289	865	72479	
5	19	3	541	378	363	374	927	2540	4226	5431	5340	4044	3414	3518	3429	3478	4434	5138	5540	6017	4463	3185	2381	1924	1325	1012	73410	
5	26	3	447	290	232	379	827	3007	4456	5832	5143	4058	3748	3841	3736	3709	4432	4695	5248	6012	4553	3386	2309	1998	1361	811	74459	
5	6	4	551	381	323	361	811	2783	4224	5542	5033	3921	3501	3417	3500	3689	4294	5077	5778	6013	4516	3253	2530	2013	1434	1021	74195	
5	13	4	617	353	308	364	881	2913	4294	5782	5193	3811	3454	3510	3568	3365	4422	5018	5796	6002	4652	3345	2511	1998	1408	941	74394	
5	20	4	579	403	348	379	853	2892	4284	5683	5262	4007	3528	3569	3638	3788	4462	5185	5854	6188	4582	3415	2493	2093	1483	1071	76150	
5	27	4	535	356	289	380	863	2884	4358	5625	5360	4039	3661	3636	3649	3726	4502	4956	5412	5890	4781	3333	2542	2036	1391	985	75115	
5	7	5	576	402	316	348	858	2790	4269	5549	5398	4186	3919	3641	3723	4086	4548	5297	5774	6037	4936	3531	2716	2362	1704	1056	76601	
5	14	5	611	390	326	381	880	2907	4264	5558	5248	4124	3586	3692	3696	3981	4486	5144	5724	6135	4743	3368	2691	2233	1596	1040	77190	
5	21	5	633	408	366	370	913	2884	4348	5623	5489	4089	3834	3830	4018	4225	4630	5322	5845	6323	4747	3725	2873	2307	1707	1158	79852	
5	28	5	664	399	333	387	868	2918	4330	5747	5390	4064	3587	3638	3799	4004	4483	5144	5808	5693	4852	3404	2763	2247	1521	1007	76579	
5	1	6	804	509	348	395	784	2485	3819	4973	4787	4046	4025	4331	4383	4565	5103	5645	5956	6441	4622	3545	2837	2225	1769	1311	79703	
5	8	6	610	513	327	396	890	2849	4157	5341	5022	3922	3881	4125	4226	4721	4934	5879	5811	6110	5145	3978	3250	2536	1898	1278	83674	
5	15	6	677	430	354	405	846	2889	4087	5343	5089	4008	4061	4369	4480	4646	5333	5869	5790	6207	5062	4286	3388	2372	1929	1378	85881	
5	22	6	708	469	350	434	847	2588	3907	5146	4968	4177	4236	4708	4962	5200	5327	5811	4971	6056	4997	3846	3454	2690	2184	1456	83408	
5	29	6	607	443	351	380	853	2800	4095	5501	5025	4026	3910	4119	4383	4650	5247	5541	5716	5893	5043	4096	3131	2509	2003	1325	81541	
						AVG Weekday				5533										5997							76490	

AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF MAY 2015

WINDHAM- I-93 NB AT BETWEEN EXITS 3-4 (02489002)

MN	DY	D	H1	H2	H3	H4	H5	H6	H7	7-8 AM	H9	H10	H11	H12	H13	H14	H15	H16	H17	5-6 PM	H19	H20	H21	H22	H23	H24	txtTotal	
5	3	1	485	538	301	166	139	169	387	776	1160	1214	1727	1985	2178	2141	2046	2196	2154	2098	1932	1569	1187	900	638	461	28539	
5	10	1	486	333	166	101	132	158	378	549	1032	1417	1921	2240	2324	2171	2215	2171	2327	2432	2110	1988	1554	1205	721	498	30454	
5	17	1	583	366	172	135	136	190	431	786	1186	1663	1998	2501	2403	2198	2031	2072	2189	2143	1983	1636	1347	1064	749	436	29918	
5	24	1	537	311	181	110	109	196	362	762	1224	1644	2143	2340	2389	2196	1983	1876	1803	2096	1730	1619	1351	1175	913	581	29385	
5	31	1	365	435	191	118	111	154	376	571	824	1080	1531	1853	1960	1755	1854	1932	2022	1787	1664	1423	1114	830	651	486	24953	
5	2	7	648	402	236	158	156	307	686	1185	1649	1840	1982	2551	2298	2307	2324	2398	2471	2348	1947	1765	1482	1336	1031	819	34446	
5	9	7	598	387	214	146	178	283	597	1464	2238	2312	2400	2686	2778	2684	2813	2719	2652	2470	2031	1702	1404	1231	1095	766	37728	
5	16	7	501	348	231	151	176	308	726	1316	1845	2027	2329	2456	2521	2505	2446	2456	2266	2250	2005	1686	1309	1221	1158	780	34973	
5	23	7	666	363	207	149	176	321	788	1524	2397	2686	3050	2944	2923	2788	2604	2576	2461	2247	2029	1642	1375	1196	1053	840	39263	
5	30	7	578	353	232	158	184	350	709	1279	1830	2286	2531	2508	2518	2341	2315	2220	2216	2042	1687	1512	1207	1274	1186	784	34387	
5	25	2	372	222	113	87	119	184	305	484	799	1071	1438	1574	1634	1671	1541	1669	1545	1441	1401	1209	1076	816	624	400	21737	Holiday
5	4	2	371	316	139	118	240	525	1171	2076	1964	1542	1452	1563	1630	1685	2276	2522	3375	3350	2699	1804	1192	959	666	640	34602	
5	11	2	266	176	144	114	267	520	1161	1969	2647	1499	1658	1664	1756	1792	2304	2938	3387	3451	2874	2066	1311	1055	670	530	35579	
5	18	2	300	186	131	127	255	545	1235	2047	2019	1668	1631	1788	1803	1855	2454	2942	3345	3447	2878	2167	1330	1083	736	514	36489	
5	5	3	349	247	138	135	196	494	1161	2055	1932	1541	1516	1632	1552	1812	2374	2860	3402	3577	2945	1815	1304	1077	845	620	35559	
5	12	3	323	226	150	130	214	541	1132	2027	1850	1522	1489	1662	1642	1817	2298	2859	3408	3175	3017	2198	1374	1152	796	556	35660	
5	19	3	359	243	188	144	242	486	1164	2025	1994	1613	1550	1658	1591	1725	2487	3070	3313	3567	2812	1972	1409	1156	823	685	36478	
5	26	3	251	146	165	120	241	551	1219	2054	1848	1608	1587	1778	1850	1863	2414	2933	3084	3581	2847	2090	1398	1119	742	486	35230	
5	6	4	387	229	172	136	195	511	1164	1981	1993	1565	1495	1648	1772	1889	2347	3004	3589	3456	2759	1992	1508	1194	817	606	35178	
5	13	4	425	208	161	129	211	521	1169	2070	1978	1502	1543	1652	1750	1844	2388	2934	3517	3556	2609	2171	1484	1144	865	664	36705	
5	20	4	398	227	176	127	228	531	1216	2104	2003	1580	1583	1669	1818	1936	2486	3006	3467	3633	2878	2149	1469	1252	898	716	37591	
5	27	4	343	205	150	127	211	536	1166	1997	2035	1680	1581	1764	1758	1914	2508	2932	3271	3418	2995	2103	1578	1196	818	589	36734	
5	7	5	459	258	156	124	225	485	1184	1980	2042	1790	1668	1748	1417	2008	2427	3037	3413	3586	2707	2042	1636	1449	922	667	37641	
5	14	5	426	248	148	144	231	528	1159	1982	2019	1734	1597	1755	1813	2074	2384	2947	3422	3546	2882	2135	1664	1359	913	652	37950	
5	21	5	440	251	179	125	239	528	1208	2005	2036	1737	1800	1843	2032	2194	2526	3120	3590	3729	2903	2184	1771	1396	992	770	39448	
5	28	5	398	209	180	142	245	512	1177	2107	2053	1705	1623	1743	1862	2074	2492	2986	3340	3265	3101	2258	1693	1323	959	643	37837	
5	1	6	543	333	212	133	264	503	1058	1862	1993	1981	1883	2214	2308	2418	2813	3320	3456	3592	2831	2205	1706	1342	1101	881	40648	
5	8	6	413	269	183	154	225	501	1161	2021	1994	1725	1781	2106	2266	2603	2690	3531	3520	3499	3086	2449	1950	1516	1108	787	41557	
5	15	6	437	240	195	149	239	486	1227	2030	2007	1747	1931	2286	2329	2528	2876	3431	3305	3505	3001	2327	1864	1440	1134	837	42164	
5	22	6	482	308	198	168	238	533	1212	2001	2068	1998	2187	2713	2979	3196	3156	3473	2976	3362	3050	2333	2246	1776	1217	990	44896	
5	29	6	403	284	186	132	228	565	1212	2096	2002	1704	1884	2165	2197	2360	3069	3285	3334	3381	3101	2486	1937	1555	1238	825	41666	
						AVG Weekday				2021										3483							38078	

AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF MAY 2015

WINDHAM- I-93 SB BETWEEN EXITS 3-4 (02489002)

MN	DY	D	H1	H2	H3	H4	H5	H6	H7	7-8 AM	H9	H10	H11	H12	H13	H14	H15	H16	H17	5-6 PM	H19	H20	H21	H22	H23	H24	txtTotal	
5	3	1	326	394	161	127	137	284	519	786	1086	1503	1989	2401	2577	2598	2533	2648	2629	2598	2174	1827	1355	897	629	285	32197	
5	10	1	327	216	136	94	121	262	466	711	1121	1605	2095	2670	2752	2950	2727	2629	2804	2750	2214	1951	1612	1033	670	329	36089	
5	17	1	345	201	117	118	165	298	591	844	1201	1751	2312	2703	2872	2897	2590	2654	2672	2870	2614	2142	1659	1129	731	356	35783	
5	24	1	279	202	128	85	145	258	516	881	915	1441	2072	2373	2452	2418	2220	2119	2222	2184	2206	2064	1756	1434	981	539	31668	
5	31	1	311	210	164	115	117	260	502	701	1053	1587	2119	2701	2933	2508	2374	2640	2533	2323	1925	1437	1053	819	585	337	31273	
5	2	7	300	195	155	143	279	638	910	1569	1588	1943	2254	2551	2436	2696	2422	2349	2396	2164	1486	1640	1176	1114	833	541	32974	
5	9	7	307	197	161	138	391	665	973	1229	1685	2127	2313	2469	2721	2502	2558	2584	2587	2486	2210	1805	1526	1333	970	622	36406	
5	16	7	335	250	185	176	289	589	1054	1290	1647	1898	2158	2516	2548	2552	2384	2467	2347	2270	1866	1424	1185	1059	702	521	33895	
5	23	7	276	195	152	117	236	506	873	1119	1525	1884	2093	2484	2304	2028	2234	2178	2187	2089	1780	1436	1257	1056	864	532	33212	
5	30	7	289	209	168	162	272	716	1161	1277	1565	1972	2180	2367	2376	2347	2210	2356	2272	2174	1854	1466	1311	1105	825	507	32967	
5	25	2	276	171	104	95	168	337	545	697	954	1543	2229	2691	3271	3814	2935	2971	2944	2562	2333	2222	1871	1341	805	389	36756	Holiday
5	4	2	187	133	120	222	621	2332	3100	3501	3197	2223	1806	1719	1747	1587	1842	2000	2085	2325	1641	1047	914	727	561	284	35806	
5	11	2	155	133	136	215	654	2346	3170	3566	3279	2351	1956	1827	1796	1853	1882	2122	2149	2434	1752	1081	937	774	513	276	37375	
5	18	2	179	182	147	217	673	2380	3137	3617	3131	2281	1990	1933	1896	1907	1972	2110	2094	2485	1768	1177	966	776	546	369	37969	
5	5	3	162	145	127	207	629	2267	3151	3568	3219	2317	1888	1769	1651	1768	1910	1997	2143	2445	1642	1162	959	825	528	331	36787	
5	12	3	170	121	149	223	685	2385	3147	3661	3198	2267	1813	1779	1711	1834	1966	1982	2106	2333	1713	1086	919	774	493	359	36824	
5	19	3	182	135	175	230	685	2044	3062	3364	3346	2431	1867	1850	1838	1753	1947	2068	2229	2456	1651	1213	983	769	569	327	37134	
5	26	3	198	144	127	259	686	2456	3237	3778	3295	2458	2186	2053	1935	1932	2016	2062	2156	2431	1704	1216	941	739	559	325	38549	
5	6	4	164	152	153	225	618	2272	3068	3561	3240	2336	2006	1763	1728	1800	1947	2073	2261	2557	1759	1263	1024	819	617	365	37751	
5	13	4	197	145	141	235	684	2382	3125	3772	3215	2309	1911	1858	1756	1529	2034	2084	2239	2446	1743	1198	1027	854	583	315	37659	
5	20	4	181	178	178	252	645	2361	3178	3578	3259	2427	1934	1900	1821	1830	1964	2180	2387	2563	1704	1266	1024	841	585	353	38568	
5	27	4	192	151	139	263	644	2388	3194	3578	3324	2439	2086	1872	1890	1812	1974	2024	2141	2472	1786	1230	1024	840	573	325	38381	
5	7	5	217	144	158	224	633	2310	3085	3569	3356	2386	1951	1783	1866	1798	2121	2050	2361	2511	1834	1289	1082	914	764	392	38980	
5	14	5	187	142	178	239	649	2378	3135	3569	3229	2390	1989	1937	1883	1907	2112	2222	2302	2589	1851	1263	1122	974	677	408	39240	
5	21	5	193	157	181	245	674	2356	3139	3618	3384	2352	2034	1981	1986	2031	2104	2202	2355	2594	1844	1261	1202	911	715	379	39904	
5	28	5	204	180	153	245	623	2406	3153	3640	3337	2358	1964	1895	1837	1928	1991	2158	2260	2428	1751	1148	1070	924	628	364	38742	
5	1	6	261	173	136	267	589	1982	2721	3002	2794	2363	2142	2117	2077	2141	2290	2325	2502	2649	1991	1440	1131	881	668	430	39073	
5	8	6	197	214	144	247	535	2148	2996	3340	3026	2196	2100	2025	1960	2118	2244	2348	2391	2611	2065	1529	1300	1020	790	491	40117	
5	15	6	240	190	158	256	610	2203	2870	3333	3085	2261	2130	2119	2151	2162	2257	2438	2481	2587	2063	1553	1294	934	795	542	40171	
5	22	6	226	172	152	266	629	2055	2695	3145	2900	2179	2049	1995	1983	2008	2171	2338	2395	2588	1947	1513	1208	922	907	481	38512	
5	29	6	204	159	165	248	625	2235	2883	3405	3043	2322	2006	1954	1996	2070	2178	2256	2382	2612	1942	1610	1194	954	765	500	39078	
							AVG Weekday			3512										2515							38412	

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF **MAY 2016**

81 269107 LONDONDERRY- I-93 NB OFF RAMP EXIT 4

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
5	8	1	101	137	54	35	26	25	97	199	232	339	480	585	707	705	631	676	660	672	653	509	405	272	148	123	8471
5	3	3	70	45	44	36	45	110	242	**422**	467	423	408	471	492	534	816	1042	1300	1478	1056	615	460	324	210	178	11288
5	4	4	91	59	49	34	41	106	269	442	475	391	453	502	559	572	837	1108	1201	1178	1040	672	480	387	190	194	11330
5	5	5	122	52	50	43	54	90	236	435	494	483	454	398	560	419	911	1076	1152	1128	1024	735	474	359	244	188	11181
5	6	6	122	91	46	41	63	109	254	441	458	405	450	562	587	667	900	1080	1113	1106	913	658	431	392	304	290	11483
5	7	7	150	97	60	42	31	61	138	295	451	644	593	666	754	816	857	791	795	666	627	521	461	365	291	246	10418
Sum	AWDT		405	247	189	154	203	415	1001	1740	1894	1702	1765	1933	2198	2192	3464	4306	4766	4890	4033	2680	1845	1462	948	850	45282
	AWDT		101	62	47	39	51	104	250	**435**	474	426	441	483	550	548	866	1077	1192	**1223**	1008	670	461	366	237	213	11321

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF **MAY 2016**

81 269106 LONDONDERRY- I-93 NB ON RAMP EXIT 4

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
5	8	1	72	51	35	30	25	58	107	194	274	438	603	609	657	599	639	569	546	439	421	377	303	238	116	76	7476
5	3	3	17	30	31	36	88	224	690	**1091**	856	610	559	542	591	596	680	830	886	729	619	401	305	223	132	68	10834
5	4	4	42	26	19	42	75	235	718	1115	877	608	568	605	619	617	692	798	782	773	572	438	329	206	146	74	10976
5	5	5	39	26	31	35	78	238	697	1068	865	691	591	618	759	654	753	871	930	886	633	433	332	252	167	85	11732
5	6	6	49	37	40	48	62	237	669	1043	899	650	618	625	703	688	806	945	878	859	627	465	377	296	223	134	11978
5	7	7	80	51	43	40	48	87	209	341	500	569	641	733	773	740	715	712	644	556	502	413	338	279	225	153	9392
Sum	AWDT		147	119	121	161	303	934	2774	4317	3497	2559	2336	2390	2672	2555	2931	3444	3476	3247	2451	1737	1343	977	668	361	45520
	AWDT		37	30	30	40	76	234	694	**1079**	874	640	584	598	668	639	733	861	869	**812**	613	434	336	244	167	90	11380

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF **MAY 2016**

81 269104 LONDONDERRY- I-93 SB OFF RAMP EXIT 4

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
5	8	1	112	68	45	20	30	68	85	192	318	424	523	629	636	686	554	632	550	496	458	340	300	187	118	63	7534
5	3	3	72	25	27	41	103	265	537	**776**	784	518	561	528	543	693	674	852	917	949	629	442	347	258	143	101	10785
5	4	4	58	34	28	48	104	277	544	773	770	537	545	598	615	570	689	804	621	953	647	435	318	251	165	88	10472
5	5	5	63	23	26	37	104	270	522	745	752	545	578	577	564	677	658	833	957	948	630	430	340	320	202	110	10911
5	6	6	76	53	45	38	112	263	511	717	734	553	619	604	665	694	724	896	950	956	674	502	357	286	218	155	11402
5	7	7	95	59	43	27	54	92	174	344	444	523	528	626	607	638	623	693	615	636	520	405	325	289	223	155	8738
Sum	AWDT		269	135	126	164	423	1075	2114	3011	3040	2153	2303	2307	2387	2634	2745	3385	3445	3806	2580	1809	1362	1115	728	454	43570
	AWDT		67	34	32	41	106	269	529	**753**	760	538	576	577	597	659	686	846	861	**952**	645	452	341	279	182	114	10893

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF **MAY 2016**

81 269108 LONDONDERRY- I-93 SB ON RAMP EXIT 4 EB TO SB

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
5	8	1	30	8	12	10	15	53	73	113	192	296	366	384	384	378	315	290	294	259	238	214	126	100	44	20	4214
5	3	3	8	19	17	39	127	438	646	**687**	587	339	282	259	289	284	288	294	266	296	239	142	99	79	40	18	5782
5	4	4	10	17	25	34	144	450	597	690	546	398	253	295	265	226	313	299	301	330	212	141	112	100	63	24	5845
5	5	5	18	16	18	25	141	419	609	677	619	388	309	261	274	292	288	313	293	298	220	155	103	80	40	18	5874
5	6	6	8	15	29	43	130	422	532	637	514	402	311	325	288	278	305	314	308	319	255	162	125	102	106	29	5959
5	7	7	20	10	12	17	44	99	171	195	268	343	362	437	430	348	379	383	318	260	245	163	154	121	65	70	4914
Sum	AWDT		44	67	89	141	542	1729	2384	2691	2266	1527	1155	1140	1116	1080	1194	1220	1168	1243	926	600	439	361	249	89	23460
	AWDT		11	17	22	35	136	432	596	**673**	567	382	289	285	279	270	299	305	292	**311**	232	150	110	90	62	22	5865

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF **MAY 2016**

81 269105 LONDONDERRY- I-93 SB ON RAMP EXIT 4 WB TO SB

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
5	8	1	37	29	7	8	22	56	83	88	173	249	383	369	369	331	323	299	283	294	200	232	158	121	115	40	4269
5	3	3	19	14	28	52	198	521	552	**534**	396	309	229	256	184	209	246	243	212	228	167	126	102	94	81	22	5022
5	4	4	17	22	32	52	200	514	568	561	414	280	244	206	240	245	249	264	268	248	160	152	110	88	80	29	5243
5	5	5	21	21	27	48	187	511	548	527	413	302	192	271	300	247	295	274	253	233	176	136	119	116	79	47	5343
5	6	6	19	19	35	50	192	484	527	524	418	283	237	245	243	264	269	260	265	268	260	159	140	110	125	56	5452
5	7	7	19	16	22	21	52	135	190	219	266	273	298	397	352	377	343	346	340	295	335	290	222	120	107	101	5136
Sum	AWDT		76	76	122	202	777	2030	2195	2146	1641	1174	902	978	967	965	1059	1041	998	977	763	573	471	408	365	154	21060
	AWDT		19	19	31	51	194	508	549	**537**	410	294	226	245	242	241	265	260	250	**244**	191	143	118	102	91	39	5265

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF **MAY 2016**

81 269103 LONDONDERRY- I-93 NB OFF RAMP EXIT 5

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
5	8	1	27	49	28	19	26	17	40	72	106	161	247	269	277	270	282	260	276	234	231	191	173	116	83	53	3507
5	29	1	48	34	25	17	29	18	48	84	129	135	185	231	224	256	234	234	184	193	193	172	120	103	98	71	3065
5	30	2	41	29	19	12	18	17	40	53	85	111	142	173	201	223	218	203	185	176	200	163	125	108	88	49	2679
5	3	3	36	43	41	42	81	165	299	387	327	292	266	299	322	365	418	478	503	356	412	287	187	144	112	88	5950
5	24	3	48	36	34	45	74	178	320	**422**	321	253	240	319	290	305	391	491	555	479	389	308	207	149	132	88	6074
5	31	3	18	23	19	41	60	193	294	375	366	295	310	315	352	318	404	536	553	515	362	292	199	199	126	102	6267
5	25	4	51	39	48	36	88	172	319	443	336	294	273	323	320	311	415	511	507	605	425	289	240	157	140	110	6452
5	26	5	64	40	38	42	93	159	300	371	345	315	256	311	311	258	547	470	491	502	391	304	223	192	142	116	6281
5	6	6	54	53	39	43	67	183	260	386	341	244	305	349	377	379	584	507	525	441	352	254	217	181	153	127	6421
5	27	6	70	37	36	39	91	180	285	419	379	306	321	365	416	405	481	438	450	409	288	253	218	163	136	124	6309
5	7	7	82	60	28	29	38	34	97	118	174	236	246	317	306	301	338	340	303	276	287	220	181	144	139	92	4386
5	28	7	53	49	23	29	22	42	88	131	186	240	277	509	299	259	264	221	205	220	185	178	136	141	120	102	3979
Sum	AWDT		341	271	255	288	554	1230	2077	2803	2415	1999	1971	2281	2388	2341	3240	3431	3584	3307	2619	1987	1491	1185	941	755	43754
	AWDT		49	39	36	41	79	176	297	**400**	345	286	282	326	341	334	463	490	512	**472**	374	284	213	169	134	108	6251

excl 5/30 - Holiday

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF **MAY 2016**

81 269102 LONDONDERRY- I-93 NB ON RAMP EXIT 5

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
5	8	1	75	31	27	17	26	53	86	147	256	417	451	530	526	525	541	445	463	397	391	326	254	159	138	53	6334
5	29	1	58	45	30	17	21	60	116	186	237	356	456	485	507	440	475	426	356	333	267	230	216	152	120	94	5683
5	30	2	38	28	23	23	26	58	123	136	182	283	364	451	447	426	418	386	360	305	307	248	241	163	108	78	5222
5	3	3	61	34	26	66	79	197	593	1083	796	512	447	460	491	507	675	825	858	857	555	381	294	192	139	71	10199
5	24	3	82	36	32	75	99	222	615	**1008**	736	513	472	518	454	494	716	806	813	792	544	423	305	205	133	95	10188
5	31	3	42	21	25	54	75	231	624	1007	830	566	557	516	513	481	751	823	799	768	525	458	305	225	151	86	10433
5	4	4	85	35	51	46	70	216	619	986	823	520	511	497	535	528	688	778	820	744	488	384	299	174	144	78	10119
5	25	4	105	69	45	63	80	246	633	965	834	569	478	547	534	553	708	863	823	821	636	436	352	250	166	98	10874
5	5	5	93	30	25	47	89	199	595	990	853	574	510	528	566	529	722	919	859	819	526	484	284	237	135	95	10708
5	26	5	115	68	33	56	108	247	604	1013	884	615	550	578	511	517	738	876	796	841	568	456	360	236	213	117	11100
5	6	6	112	48	39	63	80	220	600	939	800	585	548	591	635	620	733	901	861	821	615	505	380	244	224	136	11300
5	27	6	100	58	38	57	100	242	575	938	797	632	584	610	650	611	780	862	697	674	599	464	324	292	207	140	11031
5	7	7	111	42	32	37	45	98	197	350	443	516	578	634	594	613	647	527	522	502	437	374	301	230	190	126	8146
5	28	7	89	45	32	57	46	94	195	356	442	536	559	493	542	466	586	534	478	431	350	319	264	207	150	104	7395
Sum	AWDT		795	399	314	527	780	2020	5458	8929	7353	5086	4657	4845	4889	4840	6511	7653	7326	7137	5056	3991	2903	2055	1512	916	95952
	AWDT		88	44	35	59	87	224	606	**992**	817	565	517	538	543	538	723	850	814	**793**	562	443	323	228	168	102	10661

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION

AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF MAY 2016

81 269099 LONDONDERRY- I-93 SB OFF RAMP EXIT 5

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
5	8	1	90	63	53	30	35	39	67	141	228	332	447	559	561	562	556	527	472	452	362	346	269	189	131	61	6572
5	29	1	97	62	36	20	18	25	109	152	219	283	345	408	427	444	449	420	422	401	388	304	249	236	150	112	5776
5	30	2	75	38	33	16	26	40	72	129	152	223	305	415	458	441	497	472	419	360	342	340	274	223	161	75	5586
5	3	3	47	37	34	47	149	321	739	737	629	450	394	433	494	513	601	780	905	943	584	436	329	279	150	103	10134
5	24	3	47	35	33	40	157	301	666	**647**	902	465	446	512	495	447	564	752	899	962	584	435	344	283	143	121	10280
5	31	3	56	28	23	40	160	295	741	821	706	501	472	493	547	548	677	820	893	908	544	444	327	291	198	118	10651
5	4	4	56	45	27	42	146	306	704	746	633	442	418	482	496	516	586	793	1127	1090	708	378	337	270	147	99	10594
5	25	4	71	71	33	41	171	323	738	754	610	483	448	510	527	571	622	848	923	977	614	437	433	351	168	126	10850
5	5	5	72	38	35	41	163	305	690	866	414	252	457	499	526	520	674	798	977	890	653	434	369	324	161	139	10297
5	26	5	113	60	34	61	142	313	687	791	674	484	472	535	523	578	639	831	889	971	620	485	374	347	227	158	11008
5	6	6	75	59	44	45	173	273	714	763	649	500	459	512	584	582	644	871	940	996	618	464	356	329	216	169	11035
5	27	6	81	42	28	57	122	256	707	768	601	514	461	539	577	581	669	837	822	718	482	432	336	292	223	169	10314
5	7	7	91	64	37	38	30	100	167	311	399	443	488	523	542	561	620	621	598	547	435	335	307	297	197	159	7910
5	28	7	110	61	53	42	27	60	177	276	391	428	426	457	473	469	463	450	438	456	393	348	309	319	207	159	6992
Sum	AWDT		618	415	291	414	1383	2693	6386	6893	5818	4091	4027	4515	4769	4856	5676	7330	8375	8455	5407	3945	3205	2766	1633	1202	95163
	AWDT		69	46	32	46	154	299	710	**766**	646	455	447	502	530	540	631	814	931	**939**	601	438	356	307	181	134	10574
excl 5-24										6246																	
										781																	

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF **MAY 2016**

81 269101 LONDONDERRY- I-93 SB ON RAMP EXIT 5

	MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
	5	8	1	36	25	18	16	19	45	82	134	170	212	288	297	329	303	275	251	265	214	185	135	104	54	54	23	3534
	5	29	1	31	29	11	21	23	43	68	102	147	192	283	270	266	253	246	200	177	203	164	129	119	89	61	43	3170
	5	30	2	31	15	13	27	35	58	63	80	125	151	194	249	248	212	211	209	180	170	192	146	130	79	43	28	2889
	5	3	3	54	27	39	66	175	390	520	499	453	376	273	275	318	299	341	437	385	393	288	167	129	95	68	47	6114
	5	24	3	51	34	35	61	204	396	521	**532**	381	331	287	271	316	265	327	393	436	474	191	190	131	93	59	46	6025
	5	31	3	38	18	27	58	185	400	566	523	462	377	327	327	286	312	364	406	460	473	228	139	133	86	94	61	6350
	5	4	4	53	32	39	65	187	423	518	515	456	349	324	275	296	304	327	400	358	449	273	185	124	94	66	55	6167
	5	25	4	54	29	33	65	183	476	527	549	461	363	289	270	298	275	360	465	423	**431**	264	182	141	95	67	56	6356
	5	5	5	52	34	42	45	184	425	538	499	418	413	312	310	313	262	324	425	442	411	251	173	116	102	82	45	6218
	5	26	5	69	31	34	54	198	413	538	520	476	387	301	252	309	289	297	458	474	405	281	193	138	110	72	64	6363
	5	6	6	57	26	42	42	185	377	479	484	455	384	301	289	353	308	403	458	461	411	299	226	148	119	75	57	6439
	5	27	6	47	34	53	60	183	363	494	504	403	356	337	326	332	318	384	403	343	355	260	167	136	102	77	64	6101
	5	7	7	49	15	15	29	48	119	128	209	259	313	288	322	307	314	309	295	319	262	196	180	134	100	103	68	4381
	5	28	7	45	37	31	20	46	72	136	192	273	254	286	249	242	243	251	228	204	188	172	165	143	102	73	57	3709
ADD	6	1	4	46	30	31	63	190	402	554	561	460	350	368	274	272	268	309	399	389	469	252	162	141	90	79	42	6201
	Sum	AWDT		521	295	375	579	1874	4065	5255	5186	4425	3686	3119	2869	3093	2900	3436	4244	4171	4271	2587	1784	1337	986	739	537	62334
		AWDT		52	30	38	58	187	407	526	**519**	443	369	312	287	309	290	344	424	417	**427**	259	178	134	99	74	54	6233

Southern New Hampshire Planning Commission

438 Dubuque Street, Manchester, NH 03102
Tel: 603-669-4664 Fax:603-669-4350
Web: www.snhpc.org

DERRY
CRYSTAL AVE
SO OF TSIENNETO RD
STATE COUNT

Site Code: 82119050
Station ID:

Latitude: 0' 0.0000 Undefined

Start Time	Mon 02-May-16	Tue 03-May-16	Wed 04-May-16	Thu 05-May-16	Fri 06-May-16	Average Day	Sat 07-May-16	Sun 08-May-16	Week Average
12:00 AM	*	*	90	74	119	94	137	156	115
01:00	*	*	44	47	54	48	70	73	58
02:00	*	*	27	30	27	28	49	47	36
03:00	*	*	29	27	44	33	24	15	28
04:00	*	*	62	68	77	69	42	29	56
05:00	*	*	164	170	183	172	93	63	135
06:00	*	*	434	410	437	427	203	128	322
07:00	*	*	833	878	797	836	469	273	650
08:00	*	*	871	950	895	905	710	481	781
09:00	*	923	884	922	949	920	1116	769	927
10:00	*	948	968	933	1034	971	1239	948	1012
11:00	*	**1089**	**1113**	**1083**	**1257**	**1136**	**1468**	**1096**	**1184**
12:00 PM	*	1271	1295	1307	1477	1338	1373	**1199**	1320
01:00	*	1161	1223	1219	1360	1241	**1437**	1155	1259
02:00	*	**1368**	1348	1357	1488	1390	1371	1068	**1333**
03:00	*	1354	1348	1334	1490	1382	1313	979	1303
04:00	*	1287	**1478**	1381	**1528**	**1418**	1170	1038	1314
05:00	*	1304	1257	**1444**	1519	1381	1212	964	1283
06:00	*	1113	1133	1272	1328	1212	1091	871	1135
07:00	*	905	844	994	1112	964	1006	824	948
08:00	*	747	684	767	989	797	796	632	769
09:00	*	405	433	504	687	507	587	392	501
10:00	*	253	241	311	468	318	351	258	314
11:00	*	161	141	170	243	179	276	126	186
Day Total	0	14289	16944	17652	19562	17766	17603	13584	16969
% Avg. WkDay	0.0%	80.4%	95.4%	99.4%	110.1%				
% Avg. Week	0.0%	84.2%	99.9%	104.0%	115.3%	104.7%	103.7%	80.1%	
AM Peak	-	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00
Vol.	-	1089	1113	1083	1257	1136	1468	1096	1184
PM Peak	-	14:00	16:00	17:00	16:00	16:00	13:00	12:00	14:00
Vol.	-	1368	1478	1444	1528	1418	1437	1199	1333

Southern New Hampshire Planning Commission

438 Dubuque Street, Manchester, NH 03102
Tel: 603-669-4664 Fax:603-669-4350
Web: www.snhpc.org

DERRY
FOLSOM RD
WEST OF NH 28
STATE COUNT

Site Code: 82119076
Station ID:

Latitude: 0' 0.0000 Undefined

Start Time	Mon 02-May-16	Tue 03-May-16	Wed 04-May-16	Thu 05-May-16	Fri 06-May-16	Average Day	Sat 07-May-16	Sun 08-May-16	Week Average
12:00 AM	*	*	36	37	43	39	63	78	51
01:00	*	*	17	18	25	20	35	40	27
02:00	*	*	15	16	14	15	29	17	18
03:00	*	*	19	25	26	23	23	15	22
04:00	*	*	94	95	84	91	26	19	64
05:00	*	*	233	219	209	220	86	40	157
06:00	*	*	558	539	524	540	182	110	383
07:00	*	*	777	818	738	778	426	236	599
08:00	*	*	**795**	811	835	814	578	360	676
09:00	*	709	689	672	735	701	800	547	692
10:00	*	764	747	764	831	776	977	**793**	813
11:00	*	**776**	787	**843**	**903**	**827**	**1077**	747	**856**
12:00 PM	*	813	875	938	995	905	1025	**917**	927
01:00	*	860	904	888	1029	920	**1105**	766	925
02:00	*	1041	1033	1049	1088	1053	1032	796	1006
03:00	*	1083	1122	1084	**1211**	1125	991	750	1040
04:00	*	1126	**1296**	1165	1208	**1199**	918	685	**1066**
05:00	*	**1188**	1129	**1180**	1185	1170	811	650	1024
06:00	*	860	834	901	974	892	738	565	812
07:00	*	523	567	623	681	598	571	475	573
08:00	*	368	399	415	490	418	438	325	406
09:00	*	254	244	274	348	280	291	202	269
10:00	*	133	135	179	252	175	200	132	172
11:00	*	66	82	93	142	96	145	54	97
Day Total	0	10564	13387	13646	14570	13675	12567	9319	12675
% Avg. WkDay	0.0%	77.3%	97.9%	99.8%	106.5%				
% Avg. Week	0.0%	83.3%	105.6%	107.7%	115.0%	107.9%	99.1%	73.5%	
AM Peak	-	11:00	08:00	11:00	11:00	- 11:00	- 11:00	10:00	- 11:00 - -
Vol.	-	776	795	843	903	- 827	- 1077	793	- 856 - -
PM Peak	-	17:00	16:00	17:00	15:00	- 16:00	- 13:00	12:00	- 16:00 - -
Vol.	-	1188	1296	1180	1211	- 1199	- 1105	917	- 1066 - -

Southern New Hampshire Planning Commission

438 Dubuque Street, Manchester, NH 03102
Tel: 603-669-4664 Fax:603-669-4350
Web: www.snhpc.org

DERRY
PINKERTON ST
EAST OF TSIENNETO RD
STATE COUNT

Site Code: 82119069
Station ID:

Latitude: 0' 0.0000 Undefined

Start Time	Mon 02-May-16	Tue 03-May-16	Wed 04-May-16	Thu 05-May-16	Fri 06-May-16	Average Day	Sat 07-May-16	Sun 08-May-16	Week Average
12:00 AM	*	*	54	48	78	60	88	101	74
01:00	*	*	29	27	33	30	37	45	34
02:00	*	*	23	39	31	31	28	36	31
03:00	*	*	31	39	38	36	23	34	33
04:00	*	*	54	68	60	61	38	19	48
05:00	*	*	197	170	195	187	82	37	136
06:00	*	*	592	636	637	622	182	109	431
07:00	*	*	661	**703**	720	**695**	382	279	549
08:00	*	*	633	583	636	617	429	394	535
09:00	*	*	521	531	589	547	653	574	574
10:00	*	*	554	630	656	613	796	746	676
11:00	*	**613**	**665**	636	**725**	660	**928**	**769**	**723**
12:00 PM	*	626	709	743	731	702	854	**907**	762
01:00	*	739	684	705	783	728	932	818	777
02:00	*	933	917	881	992	931	**984**	812	920
03:00	*	910	857	890	1016	918	922	780	896
04:00	*	984	997	**1015**	**1072**	1017	903	740	952
05:00	*	**1047**	**1036**	1009	1061	**1038**	864	720	**956**
06:00	*	864	843	889	945	885	768	585	816
07:00	*	674	607	669	795	686	647	558	658
08:00	*	518	516	549	529	528	538	442	515
09:00	*	329	322	357	478	372	392	274	359
10:00	*	175	160	212	308	214	269	164	215
11:00	*	109	107	154	199	142	195	68	139
Day Total	0	8521	11769	12183	13307	12320	11934	10011	11809
% Avg. WkDay	0.0%	69.2%	95.5%	98.9%	108.0%				
% Avg. Week	0.0%	72.2%	99.7%	103.2%	112.7%	104.3%	101.1%	84.8%	
AM Peak	-	11:00	11:00	07:00	11:00	- 07:00	- 11:00	11:00	- 11:00 - -
Vol.	-	613	665	703	725	- 695	- 928	769	- 723 - -
PM Peak	-	17:00	17:00	16:00	16:00	- 17:00	- 14:00	12:00	- 17:00 - -
Vol.	-	1047	1036	1015	1072	- 1038	- 984	907	- 956 - -

Southern New Hampshire Planning Commission

438 Dubuque Street, Manchester, NH 03102
Tel: 603-669-4664 Fax:603-669-4350
Web: www.snhpc.org

DERRY
TSIENNETO RD
EAST OF PINKERTON ST
STATE COUNT

Site Code: 82119078
Station ID:

Latitude: 0' 0.0000 Undefined

Start Time	Mon 02-May-16	Tue 03-May-16	Wed 04-May-16	Thu 05-May-16	Fri 06-May-16	Average Day	Sat 07-May-16	Sun 08-May-16	Week Average
12:00 AM	*	*	31	35	47	38	85	85	57
01:00	*	*	26	25	24	25	37	32	29
02:00	*	*	27	27	20	25	35	29	28
03:00	*	*	37	42	40	40	28	15	32
04:00	*	*	127	119	109	118	51	29	87
05:00	*	*	309	320	308	312	112	56	221
06:00	*	*	938	959	909	935	301	132	648
07:00	*	*	**1097**	**1159**	1084	**1113**	561	353	851
08:00	*	*	1021	1102	1042	1055	788	461	883
09:00	*	*	873	931	946	917	929	676	871
10:00	*	*	985	950	995	977	1106	822	972
11:00	*	**1034**	1001	1131	**1202**	1092	**1286**	**879**	**1089**
12:00 PM	*	1087	1110	1101	1248	1136	1047	**983**	1096
01:00	*	1085	1083	1010	1309	1122	**1142**	745	1062
02:00	*	1446	1410	**1505**	1496	1464	1134	821	**1302**
03:00	*	1441	1382	1363	1495	1420	977	806	1244
04:00	*	**1457**	**1540**	1476	**1523**	**1499**	1005	741	1290
05:00	*	1395	1355	1346	1415	1378	886	784	1197
06:00	*	1050	885	934	998	967	767	640	879
07:00	*	594	618	666	720	650	572	515	614
08:00	*	467	393	429	526	454	466	361	440
09:00	*	247	236	277	417	294	352	218	291
10:00	*	119	119	166	306	178	241	153	184
11:00	*	80	89	95	128	98	126	47	94
Day Total	0	11502	16692	17168	18307	17307	14034	10383	15461
% Avg. WkDay	0.0%	66.5%	96.4%	99.2%	105.8%				
% Avg. Week	0.0%	74.4%	108.0%	111.0%	118.4%	111.9%	90.8%	67.2%	
AM Peak	-	11:00	07:00	07:00	11:00	- 07:00	- 11:00	11:00	- 11:00 - -
Vol.	-	1034	1097	1159	1202	- 1113	- 1286	879	- 1089 - -
PM Peak	-	16:00	16:00	14:00	16:00	- 16:00	- 13:00	12:00	- 14:00 - -
Vol.	-	1457	1540	1505	1523	- 1499	- 1142	983	- 1302 - -

Southern New Hampshire Planning Commission

438 Dubuque Street, Manchester, NH 03102
Tel: 603-669-4664 Fax:603-669-4350
Web: www.snhpc.org

DERRY
CHESTER RD
EAST OF SILVESTRI CIR
STATE COUNT

Site Code: 82119064
Station ID:

Latitude: 0' 0.0000 Undefined

Start Time	Mon 02-May-16	Tue 03-May-16	Wed 04-May-16	Thu 05-May-16	Fri 06-May-16	Average Day	Sat 07-May-16	Sun 08-May-16	Week Average
12:00 AM	*	*	35	36	39	37	72	82	53
01:00	*	*	24	34	40	33	34	49	36
02:00	*	*	28	24	34	29	29	25	28
03:00	*	*	43	47	45	45	28	16	36
04:00	*	*	139	140	146	142	53	35	103
05:00	*	*	316	299	304	306	91	70	216
06:00	*	*	519	499	532	517	215	132	379
07:00	*	*	**605**	**588**	**592**	**595**	396	251	**486**
08:00	*	*	581	506	545	544	459	307	480
09:00	*	*	367	396	390	384	562	418	427
10:00	*	369	353	400	407	382	581	551	444
11:00	*	**379**	392	390	417	394	**626**	**605**	468
12:00 PM	*	377	402	432	505	429	638	585	490
01:00	*	478	468	460	531	484	599	**620**	526
02:00	*	491	545	544	595	544	**648**	519	557
03:00	*	636	606	**647**	702	648	570	543	617
04:00	*	**663**	**697**	618	665	**661**	539	526	**618**
05:00	*	633	597	632	**714**	644	556	526	610
06:00	*	574	529	498	649	562	486	496	539
07:00	*	410	383	401	512	426	415	431	425
08:00	*	313	310	305	362	322	344	297	322
09:00	*	220	234	232	284	242	282	182	239
10:00	*	143	139	154	216	163	211	116	163
11:00	*	82	76	93	136	97	157	62	101
Day Total	0	5768	8388	8375	9362	8630	8591	7444	8363
% Avg. WkDay	0.0%	66.8%	97.2%	97.0%	108.5%				
% Avg. Week	0.0%	69.0%	100.3%	100.1%	111.9%	103.2%	102.7%	89.0%	
AM Peak	-	11:00	07:00	07:00	07:00	07:00	11:00	11:00	07:00
Vol.	-	379	605	588	592	595	626	605	486
PM Peak	-	16:00	16:00	15:00	17:00	16:00	14:00	13:00	16:00
Vol.	-	663	697	647	714	661	648	620	618

Southern New Hampshire Planning Commission

438 Dubuque Street, Manchester, NH 03102
Tel: 603-669-4664 Fax:603-669-4350
Web: www.snhpc.org

DERRY
NO. MAIN ST
NO OF ACADEMY DR
STATE COUNT

Site Code: 82119052
Station ID:

Latitude: 0' 0.0000 Undefined

Start Time	Mon 02-May-16	Tue 03-May-16	Wed 04-May-16	Thu 05-May-16	Fri 06-May-16	Average Day	Sat 07-May-16	Sun 08-May-16	Week Average
12:00 AM	*	*	21	23	39	28	45	74	40
01:00	*	*	14	13	20	16	23	41	22
02:00	*	*	11	12	20	14	20	12	15
03:00	*	*	8	7	12	9	8	12	9
04:00	*	*	37	39	39	38	19	14	30
05:00	*	*	111	100	104	105	33	32	76
06:00	*	*	695	688	644	676	146	62	447
07:00	*	*	**759**	**752**	**757**	**756**	393	203	**573**
08:00	*	*	650	679	640	656	390	259	524
09:00	*	*	459	449	449	452	462	349	434
10:00	*	*	448	487	497	477	558	442	486
11:00	*	*	455	467	520	481	**671**	**509**	524
12:00 PM	*	449	501	493	582	506	654	**646**	554
01:00	*	512	558	512	652	558	**702**	499	572
02:00	*	785	782	**850**	834	813	689	568	751
03:00	*	798	807	798	858	815	663	512	739
04:00	*	804	**904**	825	**990**	**881**	559	503	**764**
05:00	*	**833**	856	738	918	836	541	530	736
06:00	*	588	573	667	694	630	551	428	584
07:00	*	445	405	356	512	430	380	324	404
08:00	*	292	254	386	335	317	279	233	296
09:00	*	154	129	171	213	167	308	177	192
10:00	*	79	92	129	229	132	163	148	140
11:00	*	44	54	50	106	64	143	36	72
Day Total	0	5783	9583	9691	10664	9857	8400	6613	8984
% Avg. WkDay	0.0%	58.7%	97.2%	98.3%	108.2%				
% Avg. Week	0.0%	64.4%	106.7%	107.9%	118.7%	109.7%	93.5%	73.6%	
AM Peak	-	-	07:00	07:00	07:00	07:00	11:00	11:00	07:00
Vol.	-	-	759	752	757	756	671	509	573
PM Peak	-	17:00	16:00	14:00	16:00	16:00	13:00	12:00	16:00
Vol.	-	833	904	850	990	881	702	646	764

Southern New Hampshire Planning Commission

438 Dubuque Street, Manchester, NH 03102
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Web: www.snhpc.org

DERRY
NO. MAIN ST
NO OF TSIENNETO RD
STATE COUNT

Site Code: 82119062
Station ID:

Latitude: 0' 0.0000 Undefined

Start Time	Mon 02-May-16	Tue 03-May-16	Wed 04-May-16	Thu 05-May-16	Fri 06-May-16	Average Day	Sat 07-May-16	Sun 08-May-16	Week Average
12:00 AM	*	*	67	73	81	74	127	143	98
01:00	*	*	22	21	44	29	61	81	46
02:00	*	*	19	26	25	23	40	34	29
03:00	*	*	31	24	27	27	29	27	28
04:00	*	*	57	55	56	56	35	14	43
05:00	*	*	205	186	168	186	64	45	134
06:00	*	*	456	490	438	461	154	80	324
07:00	*	*	**1005**	991	**996**	997	349	188	706
08:00	*	*	996	**1014**	994	**1001**	578	369	**790**
09:00	*	*	739	727	781	749	709	507	693
10:00	*	*	568	576	662	602	795	721	664
11:00	*	*	591	617	702	637	**896**	**764**	714
12:00 PM	*	672	747	710	774	726	**1015**	**912**	805
01:00	*	668	708	676	861	728	986	836	789
02:00	*	826	829	803	959	854	942	765	854
03:00	*	1065	1042	1145	1215	1117	957	815	1040
04:00	*	1163	1196	1134	1311	1201	845	793	1074
05:00	*	**1253**	**1299**	**1199**	**1377**	**1282**	827	799	**1126**
06:00	*	1102	1094	1102	1149	1112	756	696	983
07:00	*	758	734	724	835	763	673	657	730
08:00	*	574	556	575	627	583	522	488	557
09:00	*	397	342	362	517	404	471	349	406
10:00	*	224	226	309	392	288	327	233	285
11:00	*	116	113	141	256	156	238	94	160
Day Total	0	8818	13642	13680	15247	14056	12396	10410	13078
% Avg. WkDay	0.0%	62.7%	97.1%	97.3%	108.5%				
% Avg. Week	0.0%	67.4%	104.3%	104.6%	116.6%	107.5%	94.8%	79.6%	
AM Peak	-	-	07:00	08:00	07:00	08:00	11:00	11:00	08:00
Vol.	-	-	1005	1014	996	1001	896	764	790
PM Peak	-	17:00	17:00	17:00	17:00	17:00	12:00	12:00	17:00
Vol.	-	1253	1299	1199	1377	1282	1015	912	1126

Southern New Hampshire Planning Commission

438 Dubuque Street, Manchester, NH 03102
Tel: 603-669-4664 Fax:603-669-4350
Web: www.snhpc.org

DERRY
SO. MAIN ST
SO OF THORTON ST
STATE COUNT

Site Code: 82119054
Station ID:

Latitude: 0' 0.0000 Undefined

Start Time	Mon 02-May-16	Tue 03-May-16	Wed 04-May-16	Thu 05-May-16	Fri 06-May-16	Average Day	Sat 07-May-16	Sun 08-May-16	Week Average
12:00 AM	*	*	48	57	85	63	112	133	87
01:00	*	*	35	30	43	36	53	67	46
02:00	*	*	24	26	35	28	39	40	33
03:00	*	*	33	34	37	35	24	36	33
04:00	*	*	73	84	81	79	39	23	60
05:00	*	*	230	209	219	219	82	62	160
06:00	*	*	962	946	943	950	273	154	656
07:00	*	*	**1095**	**1105**	**1129**	**1110**	623	374	865
08:00	*	*	1038	1010	1004	1017	640	548	848
09:00	*	*	797	777	842	805	882	728	805
10:00	*	*	734	860	859	818	1070	945	894
11:00	*	*	833	805	921	853	**1244**	**1020**	**965**
12:00 PM	*	810	896	909	979	898	1209	**1184**	998
01:00	*	934	890	886	1083	948	1237	980	1002
02:00	*	1002	1002	1063	1044	1028	**1285**	1085	1080
03:00	*	1221	1273	1243	1383	1280	1181	980	1214
04:00	*	1340	1352	**1418**	**1459**	1392	1143	971	**1280**
05:00	*	**1407**	**1390**	1340	1454	**1398**	1092	989	1279
06:00	*	1161	1144	1114	1295	1178	1074	806	1099
07:00	*	898	812	774	992	869	843	660	830
08:00	*	616	569	695	623	626	617	538	610
09:00	*	383	357	419	526	421	563	315	427
10:00	*	189	197	258	429	268	383	264	287
11:00	*	108	120	162	242	158	295	80	168
Day Total	0	10069	15904	16224	17707	16477	16003	12982	15726
% Avg. WkDay	0.0%	61.1%	96.5%	98.5%	107.5%				
% Avg. Week	0.0%	64.0%	101.1%	103.2%	112.6%	104.8%	101.8%	82.6%	
AM Peak	-	-	07:00	07:00	07:00	07:00	11:00	11:00	11:00
Vol.	-	-	1095	1105	1129	1110	1244	1020	965
PM Peak	-	17:00	17:00	16:00	16:00	17:00	14:00	12:00	16:00
Vol.	-	1407	1390	1418	1459	1398	1285	1184	1280

Southern New Hampshire Planning Commission

438 Dubuque Street, Manchester, NH 03102
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Web: www.snhpc.org

DERRY
TSIENNETO RD
WEST OF CHESTER RD
STATE COUNT

Site Code: 82119021
Station ID:

Latitude: 0' 0.0000 Undefined

Start Time	Mon 02-May-16	Tue 03-May-16	Wed 04-May-16	Thu 05-May-16	Fri 06-May-16	Average Day	Sat 07-May-16	Sun 08-May-16	Week Average
12:00 AM	*	*	21	23	27	24	37	49	31
01:00	*	*	16	10	15	14	15	19	15
02:00	*	*	12	10	8	10	20	23	15
03:00	*	*	15	18	11	15	12	7	13
04:00	*	*	28	29	31	29	20	13	24
05:00	*	*	122	118	108	116	35	16	80
06:00	*	*	412	421	417	417	114	37	280
07:00	*	*	**503**	**495**	**452**	**483**	259	111	**364**
08:00	*	*	429	433	415	426	297	204	356
09:00	*	*	301	316	286	301	374	312	318
10:00	*	*	311	292	323	309	441	382	350
11:00	*	**330**	330	298	342	325	**497**	**386**	364
12:00 PM	*	351	296	298	364	327	444	**394**	358
01:00	*	299	320	336	398	338	459	372	364
02:00	*	450	493	**507**	502	488	446	373	462
03:00	*	469	441	461	502	468	**483**	382	456
04:00	*	501	**499**	485	**559**	**511**	425	366	**472**
05:00	*	**508**	477	490	503	494	394	357	455
06:00	*	440	382	441	442	426	388	301	399
07:00	*	311	279	275	339	301	280	237	287
08:00	*	216	207	261	295	245	242	171	232
09:00	*	128	120	135	228	153	189	101	150
10:00	*	68	58	104	154	96	115	84	97
11:00	*	31	39	58	78	52	90	29	54
Day Total	0	4102	6111	6314	6799	6368	6076	4726	5996
% Avg. WkDay	0.0%	64.4%	96.0%	99.2%	106.8%				
% Avg. Week	0.0%	68.4%	101.9%	105.3%	113.4%	106.2%	101.3%	78.8%	
AM Peak	-	11:00	07:00	07:00	07:00	- 07:00	- 11:00	11:00	- 07:00 - -
Vol.	-	330	503	495	452	- 483	- 497	386	- 364 - -
PM Peak	-	17:00	16:00	14:00	16:00	- 16:00	- 15:00	12:00	- 16:00 - -
Vol.	-	508	499	507	559	- 511	- 483	394	- 472 - -

Southern New Hampshire Planning Commission

438 Dubuque Street, Manchester, NH 03102
Tel: 603-669-4664 Fax:603-669-4350
Web: www.snhpc.org

LONDERRY
NH 102 (NASHUA RD)
@ DERRY T/L
STAATE COUNT

Site Code: 82269058
Station ID:

Latitude: 0' 0.0000 Undefined

Start Time	Mon 02-May-16	Tue 03-May-16	Wed 04-May-16	Thu 05-May-16	Fri 06-May-16	Average Day	Sat 07-May-16	Sun 08-May-16	Week Average
12:00 AM	*	*	140	164	194	166	234	260	198
01:00	*	*	80	81	136	99	171	223	138
02:00	*	*	86	74	103	88	101	98	92
03:00	*	*	107	122	111	113	94	66	100
04:00	*	*	309	347	324	327	124	76	236
05:00	*	*	858	824	816	833	278	143	584
06:00	*	*	1327	1280	1244	1284	563	335	950
07:00	*	*	**1761**	**1750**	**1642**	**1718**	932	599	1337
08:00	*	*	1596	1665	1605	1622	1275	865	1401
09:00	*	1376	1337	1502	1404	1405	1549	1223	1398
10:00	*	1358	1408	1362	1511	1410	1761	1629	1505
11:00	*	**1411**	1448	1473	1517	1462	**1946**	**1751**	**1591**
12:00 PM	*	1489	1515	1615	1698	1579	1973	**1777**	1678
01:00	*	1507	1482	1508	1668	1541	**2014**	1761	1657
02:00	*	1587	1631	1766	1864	1712	1915	1680	1740
03:00	*	**1839**	1737	**1846**	**1915**	**1834**	1859	1559	**1792**
04:00	*	1820	1733	1731	1901	1796	1751	1507	1740
05:00	*	1730	**1773**	1737	1764	1751	1678	1482	1694
06:00	*	1616	1567	1633	1766	1646	1581	1269	1572
07:00	*	1118	1197	1253	1406	1244	1319	1133	1238
08:00	*	927	873	1021	1037	964	1095	875	971
09:00	*	691	673	777	869	752	816	580	734
10:00	*	422	429	540	691	520	631	372	514
11:00	*	252	256	340	459	327	504	231	340
Day Total	0	19143	25323	26411	27645	26193	26164	21494	25200
% Avg. WkDay	0.0%	73.1%	96.7%	100.8%	105.5%				
% Avg. Week	0.0%	76.0%	100.5%	104.8%	109.7%	103.9%	103.8%	85.3%	
AM Peak	-	11:00	07:00	07:00	07:00	- 07:00	- 11:00	11:00	- 11:00 - -
Vol.	-	1411	1761	1750	1642	- 1718	- 1946	1751	- 1591 - -
PM Peak	-	15:00	17:00	15:00	15:00	- 15:00	- 13:00	12:00	- 15:00 - -
Vol.	-	1839	1773	1846	1915	- 1834	- 2014	1777	- 1792 - -

Southern New Hampshire Planning Commission

438 Dubuque Street, Manchester, NH 03102
Tel: 603-669-4664 Fax:603-669-4350
Web: www.snhpc.org

LONDONDERRY
NH 28 (ROCKINGHAM RD)
@ DERRY T/L
STATE COUNT

Site Code: 62269053
Station ID:

Latitude: 0' 0.0000 Undefined

Start Time	Mon 02-May-16	Tue 03-May-16	Wed 04-May-16	Thu 05-May-16	Fri 06-May-16	Average Day	Sat 07-May-16	Sun 08-May-16	Week Average
12:00 AM	*	*	88	85	158	110	164	148	129
01:00	*	*	61	57	76	65	72	92	72
02:00	*	*	46	54	58	53	54	76	58
03:00	*	*	45	61	67	58	50	49	54
04:00	*	*	110	110	139	120	61	34	91
05:00	*	*	344	304	279	309	132	64	225
06:00	*	*	826	838	807	824	266	149	577
07:00	*	*	**1287**	1309	1240	1279	609	338	957
08:00	*	*	1268	**1397**	**1252**	**1306**	753	446	1023
09:00	*	*	932	1005	1061	999	1008	776	956
10:00	*	881	956	918	1009	941	1167	977	985
11:00	*	**975**	986	994	1105	1015	**1271**	**1157**	**1081**
12:00 PM	*	1075	1184	1146	1263	1167	1340	**1290**	1216
01:00	*	1024	1112	1116	1259	1128	1376	1144	1172
02:00	*	1207	1241	1229	1435	1278	**1471**	1175	1293
03:00	*	1433	1359	1549	1562	1476	1353	1050	1384
04:00	*	1563	1732	1682	1751	1682	1328	1060	1519
05:00	*	**1775**	**1916**	**1811**	**1956**	**1864**	1206	959	**1604**
06:00	*	1246	1226	1346	1424	1310	1052	812	1184
07:00	*	871	820	979	1102	943	925	735	905
08:00	*	641	630	703	823	699	720	565	680
09:00	*	457	439	583	656	534	497	331	494
10:00	*	271	277	353	492	348	396	267	343
11:00	*	182	184	237	296	225	322	130	225
Day Total	0	13601	19069	19866	21270	19733	17593	13824	18227
% Avg. WkDay	0.0%	68.9%	96.6%	100.7%	107.8%				
% Avg. Week	0.0%	74.6%	104.6%	109.0%	116.7%	108.3%	96.5%	75.8%	
AM Peak	-	11:00	07:00	08:00	08:00	- 08:00	- 11:00	11:00	- 11:00 - -
Vol.	-	975	1287	1397	1252	- 1306	- 1271	1157	- 1081 - -
PM Peak	-	17:00	17:00	17:00	17:00	- 17:00	- 14:00	12:00	- 17:00 - -
Vol.	-	1775	1916	1811	1956	- 1864	- 1471	1290	- 1604 - -

Southern New Hampshire Planning Commission

438 Dubuque Street, Manchester, NH 03102
Tel: 603-669-4664 Fax:603-669-4350
Web: www.snhpc.org

LONDONDERRY
GILCREST RD
NO OF NH 102
STATE COUNT

Site Code: 82269082
Station ID:

Latitude: 0' 0.0000 Undefined

Start Time	Mon 02-May-16	Tue 03-May-16	Wed 04-May-16	Thu 05-May-16	Fri 06-May-16	Average Day	Sat 07-May-16	Sun 08-May-16	Week Average
12:00 AM	*	*	22	26	36	28	51	51	37
01:00	*	*	14	21	18	18	39	51	29
02:00	*	*	17	15	19	17	20	11	16
03:00	*	*	11	15	22	16	18	6	14
04:00	*	*	53	52	38	48	17	15	35
05:00	*	*	209	218	184	204	63	36	142
06:00	*	*	443	417	384	415	117	75	287
07:00	*	*	690	724	678	697	311	216	524
08:00	*	**703**	**702**	**858**	**763**	**756**	509	370	651
09:00	*	554	631	618	618	605	676	563	610
10:00	*	565	584	561	608	580	877	689	647
11:00	*	566	627	593	710	624	**991**	**736**	**704**
12:00 PM	*	701	697	708	806	728	900	**884**	783
01:00	*	648	678	653	775	688	911	794	743
02:00	*	708	753	800	836	774	912	738	791
03:00	*	867	886	938	978	917	**938**	718	888
04:00	*	946	**1054**	994	1040	1008	877	720	938
05:00	*	**1113**	1026	**1030**	**1044**	**1053**	777	666	**943**
06:00	*	892	732	844	896	841	655	563	764
07:00	*	528	524	537	640	557	510	447	531
08:00	*	360	365	389	432	386	424	315	381
09:00	*	212	210	228	308	240	291	144	232
10:00	*	116	120	122	210	142	174	83	138
11:00	*	58	67	75	119	80	119	43	80
Day Total	0	9537	11115	11436	12162	11422	11177	8934	10908
% Avg. WkDay	0.0%	83.5%	97.3%	100.1%	106.5%				
% Avg. Week	0.0%	87.4%	101.9%	104.8%	111.5%	104.7%	102.5%	81.9%	
AM Peak	-	08:00	08:00	08:00	08:00	- 08:00	- 11:00	11:00	- 11:00 - -
Vol.	-	703	702	858	763	- 756	- 991	736	- 704 - -
PM Peak	-	17:00	16:00	17:00	17:00	- 17:00	- 15:00	12:00	- 17:00 - -
Vol.	-	1113	1054	1030	1044	- 1053	- 938	884	- 943 - -

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC 2/22/2016
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF APRIL 2014

82 119071 DERRY- NH 102 (EAST BROADWAY) WEST OF ABBOT ST

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
4	20	1	153	103	64	35	34	85	168	343	438	641	792	931	1073	840	737	669	751	786	878	710	555	326	178	132	11422
4	15	3	64	44	47	48	180	426	861	1021	904	798	745	811	817	824	1008	1096	1031	1048	976	769	608	343	221	165	14855
4	16	4	66	47	49	65	142	420	811	1002	903	717	698	760	735	813	1026	1014	1052	1107	1052	805	652	409	269	139	14753
4	17	5	89	49	44	49	175	458	884	1025	955	741	704	779	821	853	912	1122	1141	1192	1042	856	630	514	273	176	15484
4	18	6	76	59	50	54	155	379	832	1031	941	845	800	893	926	1015	1154	1147	1169	1198	1103	798	563	526	417	311	16442
4	19	7	149	99	47	29	73	145	323	677	780	1060	1081	1131	1136	1092	1153	1049	997	965	867	725	585	507	393	231	15294

TYPE	STATION	YEAR	MONTH	NO. DAYS	AVERAGE SUNDAY	AVERAGE WEEKDAY	AVERAGE SATURDAY	AVERAGE DAILY	COMPUTED VOLUME	PERCENT GAIN	PERCENT LOSS
82	119071	2014	April	6	11422	15384	15294	14843	445301		

PEAK HOUR VOLUMES:

	AVERAGE AM:	AVERAGE MIDDAY:	AVERAGE PM:	
SUNDAY	641	1073	878	AM - 6 AM TO 10 AM
WEEKDAY	1020	876	1148	MIDDAY - 10 AM TO 2 PM
SATURDAY	1060	1136	1153	PM - 2 PM TO 8 PM

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC 2/22/2016
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF APRIL 2014

82 119011 DERRY- NH 102 (BROADWAY) EAST OF GRIFFIN ST

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
4	20	1	175	119	63	49	47	77	151	304	437	665	832	989	1216	941	781	718	809	862	883	742	582	364	221	135	12162
4	15	3	80	65	56	71	202	544	772	1033	1020	976	983	1017	1091	1050	1083	1136	1137	1128	1034	742	645	432	271	210	16778
4	16	4	91	55	50	78	163	519	779	972	1024	970	1054	1073	1007	1030	1207	1229	1155	1150	1103	889	697	536	335	189	17355
4	17	5	112	68	58	76	197	560	794	1065	1056	933	1027	1061	1056	1096	1117	1243	1149	1190	1173	936	844	611	360	234	18016
4	18	6	135	90	73	75	187	483	751	1006	1062	1094	1067	1150	1211	1183	1259	1258	1285	1262	1157	946	735	590	448	354	18861
4	19	7	182	112	75	41	84	165	337	638	868	1073	1251	1289	1359	1344	1302	1245	1121	1090	998	833	699	567	446	283	17402

TYPE	STATION	YEAR	MONTH	NO. DAYS	AVERAGE SUNDAY	AVERAGE WEEKDAY	AVERAGE SATURDAY	AVERAGE DAILY	COMPUTED VOLUME	PERCENT GAIN	PERCENT LOSS
82	119011	2014	April	6	12162	17752	17402	16960	508811		

PEAK HOUR VOLUMES:

	AVERAGE AM:	AVERAGE MIDDAY:	AVERAGE PM:	
SUNDAY	665	1216	883	AM - 6 AM TO 10 AM
WEEKDAY	1054	1118	1224	MIDDAY - 10 AM TO 2 PM
SATURDAY	1073	1359	1302	PM - 2 PM TO 8 PM

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF APRIL 2014

2/22/2016

82 119091 DERRY- FORDWAY ST OVER BEAVER BROOK

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
4	20	1	51	37	22	10	12	17	38	93	102	215	229	325	335	315	240	214	264	237	295	257	181	125	56	33	3703
4	15	3	37	18	13	12	45	112	283	422	442	350	305	289	364	327	364	357	434	432	319	230	168	111	66	54	5554
4	16	4	28	12	14	13	49	98	228	357	375	284	308	298	297	343	386	412	414	448	374	229	177	129	79	59	5411
4	17	5	32	8	14	13	51	117	258	427	393	295	295	349	359	352	410	431	414	504	406	315	203	149	96	72	5963
4	18	6	37	19	11	7	33	116	253	345	398	356	379	393	419	420	487	539	513	493	412	279	211	167	124	86	6497
4	19	7	48	35	12	14	19	37	94	222	368	492	468	570	548	534	589	492	370	352	280	237	169	160	118	73	6301

TYPE	STATION	YEAR	MONTH	NO. DAYS	AVERAGE SUNDAY	AVERAGE WEEKDAY	AVERAGE SATURDAY	AVERAGE DAILY	COMPUTED VOLUME	PERCENT GAIN	PERCENT LOSS
82	119091	2014	April	6	3703	5856	6301	5628	168854		

PEAK HOUR VOLUMES:

	AVERAGE AM:	AVERAGE MIDDAY:	AVERAGE PM:
SUNDAY	215	335	295
WEEKDAY	410	372	481
SATURDAY	492	570	589

AM - 6 AM TO 10 AM
MIDDAY - 10 AM TO 2 PM
PM - 2 PM TO 8 PM

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF APRIL 2014

2/22/2016

82 119060 DERRY- FRANKLIN ST EXT NORTH OF FOLSOM RD

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
4	27	1	15	2	4	4	3	2	15	47	49	76	97	103	128	119	107	104	79	84	66	51	61	27	35	10	1288
4	23	4	16	4	5	5	10	30	78	86	99	87	103	102	130	100	135	158	162	158	123	90	69	51	32	7	1840
4	24	5	6	9	1	4	7	37	90	97	78	49	87	76	132	101	127	166	175	172	149	128	95	62	28	13	1889
4	25	6	11	10	3	3	10	30	74	101	99	90	94	127	171	143	130	170	175	151	125	101	77	60	34	25	2014
4	26	7	9	7	3	1	3	8	17	51	59	101	109	117	127	129	138	88	89	100	96	67	32	36	32	20	1439

TYPE	STATION	YEAR	MONTH	NO. DAYS	AVERAGE SUNDAY	AVERAGE WEEKDAY	AVERAGE SATURDAY	AVERAGE DAILY	COMPUTED VOLUME	PERCENT GAIN	PERCENT LOSS
82	119060	2014	April	5	1288	1914	1439	1767	53023		

PEAK HOUR VOLUMES:

	AVERAGE AM:	AVERAGE MIDDAY:	AVERAGE PM:
SUNDAY	76	128	107
WEEKDAY	99	144	171
SATURDAY	101	129	138

AM - 6 AM TO 10 AM
MIDDAY - 10 AM TO 2 PM
PM - 2 PM TO 8 PM

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC 2/22/2016
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF JULY 2014

62 269054 LONDONDERRY- NH 28 (ROCKINGHAM RD) EAST OF PERKINS RD

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
7	20	1	182	77	44	58	65	98	143	281	576	631	811	975	896	1014	994	931	1054	1034	853	769	576	392	249	151	12854
7	16	4	163	96	116	114	233	663	1009	1361	1432	1071	958	1031	1005	1072	1094	1457	1593	1607	1139	818	729	462	334	223	19780
7	17	5	171	105	98	118	257	640	1065	1409	1401	1107	1004	1022	1108	1134	1198	1504	1623	1757	1253	909	752	527	387	240	20789
7	18	6	206	132	103	117	196	564	1003	1289	1376	1141	1060	1006	1143	1147	1455	1605	1758	1721	1312	1090	723	493	452	339	21431
7	19	7	257	132	101	104	117	202	277	435	598	751	902	951	1078	993	1056	975	933	790	686	599	494	453	322	258	13464

TYPE	STATION	YEAR	MONTH	NO. DAYS	AVERAGE SUNDAY	AVERAGE WEEKDAY	AVERAGE SATURDAY	AVERAGE DAILY	COMPUTED VOLUME	PERCENT GAIN	PERCENT LOSS
62	269054	2014	July	5	12854	20667	13464	18729	580605		

PEAK HOUR VOLUMES:

	AVERAGE AM:	AVERAGE MIDDAY:	AVERAGE PM:	
SUNDAY	631	1014	1054	AM - 6 AM TO 10 AM
WEEKDAY	1406	1118	1707	MIDDAY - 10 AM TO 2 PM
SATURDAY	751	1078	1056	PM - 2 PM TO 8 PM

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF JUNE 2015

2/22/2016

82 119070 DERRY- NH 28 (CRYSTAL AVE) SOUTH OF ROLLINS ST

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
6	28	1	135	69	39	24	31	52	105	249	313	556	693	809	932	952	875	861	808	789	741	678	456	342	217	101	10827
6	24	4	118	62	26	31	80	185	374	627	771	804	905	973	1040	1028	1040	1011	1137	1161	1012	892	810	576	336	203	15202
6	25	5	117	54	38	29	74	181	392	642	823	816	862	1068	1110	1071	1079	1050	1094	1130	966	854	773	572	394	205	15394
6	26	6	119	59	39	28	75	194	370	620	727	829	867	1036	1125	1144	1127	1081	1139	1230	1137	955	779	694	436	297	16107
6	27	7	178	90	55	41	56	110	207	402	574	842	1051	1061	1128	1054	1018	1003	882	894	815	759	618	529	331	163	13861

TYPE	STATION	YEAR	MONTH	NO. DAYS	AVERAGE SUNDAY	AVERAGE WEEKDAY	AVERAGE SATURDAY	AVERAGE DAILY	COMPUTED VOLUME	PERCENT GAIN	PERCENT LOSS
82	119070	2015	June	5	10827	15568	13861	14708	441241		

PEAK HOUR VOLUMES:

	AVERAGE AM:	AVERAGE MIDDAY:	AVERAGE PM:	
SUNDAY	556	952	875	AM - 6 AM TO 10 AM
WEEKDAY	819	1098	1174	MIDDAY - 10 AM TO 2 PM
SATURDAY	842	1128	1018	PM - 2 PM TO 8 PM

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC 2/22/2016
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF APRIL 2014

82 119059 DERRY- ASH ST AT LONDONDERRY TL

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
4	20	1	25	16	7	10	11	39	51	102	154	224	292	324	404	284	226	235	205	271	249	207	139	68	43	23	3609
4	15	3	12	5	8	5	39	100	306	405	382	331	354	411	488	417	454	551	665	608	461	314	203	107	54	43	6723
4	16	4	15	14	9	4	29	106	281	386	357	369	404	471	483	428	496	603	619	678	561	366	218	108	61	34	7100
4	17	5	18	11	9	8	34	125	327	419	424	345	408	456	548	483	576	613	768	753	556	382	254	182	71	60	7830
4	18	6	21	17	6	6	31	98	255	380	419	427	438	568	559	512	651	724	777	707	574	419	257	196	94	67	8203
4	19	7	24	14	13	9	17	40	89	226	345	457	563	636	662	599	629	613	516	468	449	290	259	146	95	53	7212

TYPE	STATION	YEAR	MONTH	NO. DAYS	AVERAGE SUNDAY	AVERAGE WEEKDAY	AVERAGE SATURDAY	AVERAGE DAILY	COMPUTED VOLUME	PERCENT GAIN	PERCENT LOSS
82	119059	2014	April	6	3609	7464	7212	6916	207492		

PEAK HOUR VOLUMES:

	AVERAGE AM:	AVERAGE MIDDAY:	AVERAGE PM:
SUNDAY	224	404	271
WEEKDAY	410	522	722
SATURDAY	457	662	629

AM - 6 AM TO 10 AM
MIDDAY - 10 AM TO 2 PM
PM - 2 PM TO 8 PM

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC 2/22/2016
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF JUNE 2015

82 269015 LONDONDERRY- ASH ST EAST OF LONDONDERRY RD

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
6	28	1	40	22	11	12	15	23	58	87	166	273	394	446	468	490	471	441	396	334	259	212	128	119	59	34	4958
6	24	4	28	12	13	15	50	107	282	402	431	400	420	460	544	474	530	627	665	689	555	418	309	158	87	45	7721
6	25	5	29	16	20	18	43	103	276	364	431	386	423	420	444	475	483	636	693	716	523	402	302	169	90	67	7529
6	26	6	37	13	14	11	36	104	233	360	390	419	478	539	567	535	626	667	752	765	564	398	303	201	107	67	8186
6	27	7	25	40	18	13	29	49	103	216	357	524	595	628	630	502	566	495	475	399	336	275	227	138	88	54	6782

TYPE	STATION	YEAR	MONTH	NO. DAYS	AVERAGE SUNDAY	AVERAGE WEEKDAY	AVERAGE SATURDAY	AVERAGE DAILY	COMPUTED VOLUME	PERCENT GAIN	PERCENT LOSS
82	269015	2015	June	5	4958	7812	6782	7294	218824		

PEAK HOUR VOLUMES:

	AVERAGE AM:	AVERAGE MIDDAY:	AVERAGE PM:	
SUNDAY	273	490	471	AM - 6 AM TO 10 AM
WEEKDAY	427	529	723	MIDDAY - 10 AM TO 2 PM
SATURDAY	524	630	566	PM - 2 PM TO 8 PM

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC 2/22/2016
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF SEPTEMBER 2015

82 269046 LONDONDERRY- NH 28 (ROCKINGHAM RD) NORTH OF LIBERTY DR

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
9	6	1	81	54	47	36	56	86	180	260	371	619	663	657	768	749	623	546	499	516	552	470	424	334	207	177	8975
9	7	2	60	55	36	30	50	109	200	248	382	486	583	642	577	564	467	474	450	434	429	410	311	255	132	101	7485
9	2	4	99	70	57	70	179	469	1026	1402	1136	872	906	862	891	874	946	1107	1169	1172	836	761	582	423	266	192	16367
9	3	5	113	80	71	73	203	480	1045	1471	1208	917	863	922	895	895	1058	1140	1301	1292	908	819	693	410	301	179	17337
9	4	6	104	80	54	84	198	446	1011	1347	1111	984	953	1018	1093	1003	1154	1235	1267	1223	993	780	586	522	340	231	17817
9	5	7	147	91	61	50	82	159	330	544	709	757	886	954	881	852	795	733	663	673	651	573	489	417	286	165	11948

TYPE	STATION	YEAR	MONTH	NO. DAYS	AVERAGE SUNDAY	AVERAGE WEEKDAY	AVERAGE SATURDAY	AVERAGE DAILY	COMPUTED VOLUME	PERCENT GAIN	PERCENT LOSS
82	269046	2015	September	6	8975	14752	11948	13608	408225		

PEAK HOUR VOLUMES:

	AVERAGE AM:	AVERAGE MIDDAY:	AVERAGE PM:
SUNDAY	619	768	623
WEEKDAY	1176	891	1054
SATURDAY	757	954	795

AM - 6 AM TO 10 AM
MIDDAY - 10 AM TO 2 PM
PM - 2 PM TO 8 PM

STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION - BUREAU OF TRAFFIC 2/22/2016
IN COOPERATION WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
AUTOMATIC TRAFFIC RECORDER DATA FOR THE MONTH OF JULY 2015

82 269048 LONDONDERRY- NH 102 (NASHUA RD) EAST OF HAMPTON DR

MON	DATE	DAY	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Total
7	29	4	195	137	109	154	379	1069	1737	2502	2383	2009	1875	1962	2127	2054	2213	2535	2739	2915	2197	1551	1368	892	554	360	36016
7	30	5	215	132	104	155	399	1039	1761	2560	2453	2022	2032	2258	2418	2347	2404	2731	2885	2876	2233	1546	1202	882	541	331	37526
7	31	6	186	136	115	148	391	958	1615	2332	2371	2294	2266	2343	2501	2454	2476	2686	2725	2690	2179	1622	1390	966	653	469	37966

TYPE	STATION	YEAR	MONTH	NO. DAYS	AVERAGE SUNDAY	AVERAGE WEEKDAY	AVERAGE SATURDAY	AVERAGE DAILY	COMPUTED VOLUME	PERCENT GAIN	PERCENT LOSS
82	269048	2015	July	3	0	37169	0	*	*		

PEAK HOUR VOLUMES:

	AVERAGE AM:	AVERAGE MIDDAY:	AVERAGE PM:
SUNDAY	*	*	*
WEEKDAY	2478	2349	2842
SATURDAY	*	*	*

AM - 6 AM TO 10 AM
MIDDAY - 10 AM TO 2 PM
PM - 2 PM TO 8 PM

Project: Exit 4a SDEIS

Loc 1 Location: **Exit 4 NB ramps**

Growth rates:

Annual 2014->2015 **1.025**

2016->2015 **0.975**

Seasonal:

	AM Peak	PM Peak
May-16 Adj Factor=	**0.96**	**0.98**

Total Adjustments:		AM Peak	PM Peak
	2014->2015	**0.984**	**1.0045**
	2016->2015	**0.936**	**0.9555**

		2016- Raw		2016 - AADT				2015 - AADT				2015 - AWDT- Balanced from TMC and ATRs			
		AM Peak (730-830)	PM Peak (445-545)	AM Peak (730-830)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (730-830)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (730-830)	Approach Totals	PM Peak (445-545)	Approach Totals
EB	LT	562	536	540	1085	525	1343	527	1058	512	1310	585	1175	475	1215
	Thru	568	835	545		818		531		798		590		740	
	RT	0	0	0		0		0		0		0		0	
WB	LT	0	0	0	1240	0	877	0	1209	0	855	0	1350	0	800
	Thru	836	542	803		531		783		518		875		485	
	RT	455	353	437		346		426		337		475		315	
NB	LT	219	535	210	412	524	1071	205	402	511	1044	210	410	580	1185
	Thru	0	0	0		0		0		0		0		0	
	RT	210	558	202		547		197		533		200		605	
SB	LT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Thru	0	0	0		0		0		0		0		0	
	RT	0	0	0		0		0		0		0		0	
	total	2850	3359	2737	2737	3291	3291	2669	2669	3209	3209	2935	2935	3200	3200

Use Seasonal Factor

Use Annual Factor
Balance to SB ramp

	WB		NB		EB		
	RT	TH	RT	LT	TH	LT	Total
700-800	518	813	188	187	505	527	2738
715-815	520	803	199	207	534	562	2825
730-830	455	836	210	219	568	562	**2850**
745-845	399	856	217	231	577	540	2820
800-900	346	847	202	223	573	514	2705

		Southbound		Westbound (NH 102)						Northbound (Exit 4 NB Ramp)				Eastbound (NH 102)					
Time Period	**Class.**	**I**	**O**	**R**	**T**	**U**	**I**	**O**	**R**	**T**	**L**	**I**	**O**	**T**	**L**	**U**	**I**	**O**	**Total**
Peak 1	Lights	0	983	441	816	0	1257	737	200	0	196	396	0	537	542	1	1080	1013	2733
Specified Period	%	0%	97%	97%	98%	0%	97%	95%	95%	0%	89%	92%	0%	95%	96%	100%	95%	96%	96%
7:00 AM - 9:15 AM	Other Vehicles	0	34	14	20	0	34	41	10	0	23	33	0	31	20	0	51	43	118
One Hour Peak	%	0%	3%	3%	2%	0%	3%	5%	5%	0%	11%	8%	0%	5%	4%	0%	5%	4%	4%
7:30 AM - 8:30 AM	**Total**	**0**	**1017**	**455**	**836**	**0**	**1291**	**778**	**210**	**0**	**219**	**429**	**0**	**568**	**562**	**1**	**1131**	**1056**	**2851**
	PHF	0	0.9	0.84	0.82	0	0.92	0.9	0.85	0	0.84	0.88	0	0.93	0.88	0.25	0.94	0.85	0.94
	Approach %	0%	36%				45%	27%				15%	0%				40%	37%	

	WB		NB		EB		
	RT	TH	RT	LT	TH	LT	Total
400-500	303	622	533	530	725	517	3230
415-515	357	597	543	524	743	520	3284
430-530	367	560	538	532	801	525	3323
445-545	353	542	558	535	835	536	**3359**
500-600	314	516	591	570	823	508	3322

		Southbound		Westbound (NH 102)						Northbound (Exit 4 NB off ramp)				Eastbound (NH 102)					
Time Period	**Class.**	**I**	**O**	**R**	**T**	**U**	**I**	**O**	**R**	**T**	**L**	**I**	**O**	**T**	**L**	**U**	**I**	**O**	**Total**
Peak 1	Lights	0	867	342	536	0	878	1369	552	0	527	1079	0	817	525	0	1342	1063	3299
Specified Period	%	0%	98%	97%	99%	0%	98%	98%	99%	0%	99%	99%	0%	98%	98%	0%	98%	99%	98%
4:00 PM - 6:15 PM	Other Vehicles	0	22	11	6	0	17	24	6	0	8	14	0	18	11	0	29	14	60
One Hour Peak	%	0%	2%	3%	1%	0%	2%	2%	1%	0%	1%	1%	0%	2%	2%	0%	2%	1%	2%
4:45 PM - 5:45 PM	**Total**	**0**	**889**	**353**	**542**	**0**	**895**	**1393**	**558**	**0**	**535**	**1093**	**0**	**835**	**536**	**0**	**1371**	**1077**	**3359**
	PHF	0	0.87	0.77	0.95	0	0.87	0.98	0.91	0	0.92	0.92	0	0.92	0.95	0	0.96	0.96	0.96
	Approach %	0%	26%				27%	41%				33%	0%				41%	32%	

Project: Exit 4a SDEIS

Loc **2** Location: **Exit 4 SB ramps**

Growth rates:

Annual	2014->2015	**1.025**	
	2016->2015	**0.975**	

Seasonal

	AM Peak	PM Peak
May-16 Adj Factor=	**0.96**	**0.98**

		AM Peak	PM Peak
Total Adjustments:	2014->2015	**0.984**	**1.0045**
	2016->2015	**0.936**	**0.9555**

		2016- Raw		**2016 - AADT**				**2015 - AADT**				**2015 - AWDT- Balanced from TMC and ATRs**			
		AM Peak (730-830)	PM Peak (445-545)	AM Peak (730-830)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (730-830)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (730-830)	Approach Totals	PM Peak (445-545)	Approach Totals
EB	LT	0	0	0	1475	0	1336	0	1439	0	1302	0	1580	0	1235
	Thru	849	1052	815		1031		795		1005		915		935	
	RT	687	311	660		305		644		297		665		300	
WB	LT	0	0	0	1078	0	1138	0	1051	0	1110	0	1085	0	1065
	Thru	589	917	565		899		551		877		565		850	
	RT	534	244	513		239		500		233		520		215	
NB	LT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Thru	0	0	0		0		0		0		0		0	
	RT	0	0	0		0		0		0				0	
SB	LT	246	300	236	777	294	963	230	757	287	939	260	755	280	925
	Thru	0	0	0		0		0		0		0		0	
	RT	564	683	541		669		527		652		495		645	
	total	3469	3507	3330	3330	3437	3437	3247	3247	3351	3351	3420	3420	3225	3225

Use Seasonal Factor

Use Annual Factor

Balance to NB ramp

	SB RT	SB LT	WB T	EB T	Total
700-800	532	219	517	832	2100
715-815	536	240	552	846	2174
730-830	504	246	589	849	**2188**
745-845	503	267	608	816	2194
800-900	510	266	610	794	2180

		Southbound (Ex 4 SB Off)				**Westbound (NH 102)**				**Eastbound (NH 102)**				
Time Period	**Class.**	**R**	**L**	**I**	**O**	**T**	**U**	**I**	**O**	**T**	**U**	**I**	**O**	**Total**
Peak 1	Lights	474	251	725	0	570	0	570	1035	784	0	784	1044	2079
Specified Period	%	94%	94%	96%	0%	94%	0%	94%	96%	96%	0%	96%	94%	95%
7:00 AM - 9:15 AM	Other Vehicles	29	16	45	0	38	0	38	48	32	0	32	67	115
One Hour Peak	%	6%	6%	6%	0%	6%	0%	6%	4%	4%	0%	4%	6%	5%
7:45 AM - 8:45 AM	**Total**	**503**	**267**	**770**	**0**	**608**	**0**	**608**	**1083**	**816**	**0**	**816**	**1111**	**2194**
	PHF	0.89	0.89	0.89	0	0.88	0	0.88	0.95	0.93	0	0.93	0.92	0.94
	Approach %			35%	0%			28%	49%			37%	51%	

	SB RT	SB LT	WB Th	EB TH	LT	Total
400-500	560	247	1013	1014	0	2834
415-515	597	260	973	998	0	2828
430-530	637	286	939	1051	0	2913
445-545	683	300	917	1052	0	2952
500-600	665	307	911	1006	0	2889

		Southbound (Exit 4 SB off)					**Westbound (NH 102)**				**Eastbound (NH 102)**					
Time Period	**Class.**	**R**	**L**	**U**	**I**	**O**	**R**	**T**	**U**	**I**	**O**	**T**	**L**	**U**	**I**	**O**	**Total**
Peak 1	Lights	669	286	0	955	0	0	907	0	907	1325	1039	0	0	1039	1576	2901
Specified Period	%	98%	95%	0%	97%	0%	0%	99%	0%	99%	98%	99%	0%	0%	99%	99%	98%
4:00 PM - 6:15 PM	Other Vehicles	14	14	0	28	0	0	10	0	10	27	13	0	0	13	24	51
One Hour Peak	%	2%	5%	0%	3%	0%	0%	1%	0%	1%	2%	1%	0%	0%	1%	2%	2%
4:45 PM - 5:45 PM	**Total**	**683**	**300**	**0**	**983**	**0**	**0**	**917**	**0**	**917**	**1352**	**1052**	**0**	**0**	**1052**	**1600**	**2952**
	PHF	0.92	0.91	0	0.92	0	0	0.89	0	0.89	0.92	0.92	0	0	0.92	0.96	0.95
	Approach %				33%	0%				31%	46%				35%	54%	

Project: Exit 4a SDEIS

Loc 3 Location: **Exit 5 NB ramps**

Growth rates:

Annual	2014->2015	**1.025**
	2016->2015	**0.975**

Seasonal:

	AM Peak	PM Peak
May-16 Adj Factor=	**0.96**	**0.98**

	AM Peak	PM Peak
Total Adjustments: 2014->2015	**0.984**	**1.0045**
2016->2015	**0.936**	**0.9555**

		2016- Raw		2016 - AADT				2015 - AADT				2015 - AWDT- Balanced from TMC and ATRs			
		AM Peak (730-830)	PM Peak (445-545)	AM Peak (730-830)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (730-830)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (730-830)	Approach Totals	PM Peak (445-545)	Approach Totals
EB	LT	216	228	207	913	223	1310	202	890	217	1277	240	980	235	1295
	Thru	735	1109	706		1087		688		1060		740		1060	
	RT	0	0	0		0		0		0		0		0	
WB	LT	0	0	0	1191	0	898	0	1161	0	875	0	1280	0	960
	Thru	569	401	546		393		532		383		540		425	
	RT	672	515	645		505		629		492		740		535	
NB	LT	273	210	262	358	206	425	255	349	201	415	300	410	220	460
	Thru	0	0	0		0		0		0		0		0	
	RT	100	223	96		219		94		214		110		240	
SB	LT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Thru	0	0	0		0		0		0		0		0	
	RT	0	0	0		0		0		0		0		0	
	total	2565	2686	2462	2462	2633	2633	2400	2400	2567	2567	2670	2670	2715	2715

Use Seasonal Factor

Use Annual Factor
Balance to SB ramp

	WB RT	WB TH	NB RT	NB LT	EB TH	EB LT	Total
700-800	724	607	97	281	573	232	2514
715-815	710	588	96	289	674	221	2578
730-830	672	569	100	273	735	216	**2565**
745-845	592	531	94	244	796	186	2443
800-900	530	470	98	199	788	176	2261

		Southbound					Westbound (NH 28)			Northbound (Ex. 5 NB Off-Ramp)				Eastbound (NH 28)				
Time Period	**Class.**	**I**	**O**	**R**	**T**	**U**	**I**	**O**	**R**	**T**	**L**	**I**	**O**	**T**	**L**	**U**	**I**	**O**	**Total**
Peak 1	Lights	0	875	682	554	0	1236	698	82	0	269	351	0	616	193	0	809	823	2396
Specified Period	%	0%	94%	96%	94%	0%	95%	91%	85%	0%	93%	91%	0%	91%	87%	0%	90%	94%	93%
7:00 AM - 9:00 AM	Other Vehicles	0	56	28	34	0	62	72	14	0	20	34	0	58	28	0	86	54	182
One Hour Peak	%	0%	6%	4%	6%	0%	5%	9%	15%	0%	7%	9%	0%	9%	13%	0%	10%	6%	7%
7:15 AM - 8:15 AM	**Total**	**0**	**931**	**710**	**588**	**0**	**1298**	**770**	**96**	**0**	**289**	**385**	**0**	**674**	**221**	**0**	**895**	**877**	**2578**
	PHF	0	0.87	0.89	0.85	0	0.9	0.78	0.86	0	0.73	0.78	0	0.76	0.8	0	0.87	0.81	0.89
	Approach %	0%	36%				50%	30%				15%	0%				35%	34%	

	WB RT	WB TH	NB RT	NB LT	EB TH	EB LT	Total
400-500	500	449	143	143	985	209	2429
415-515	500	429	130	118	1017	232	2426
430-530	514	415	168	161	1066	231	2555
445-545	515	401	223	210	1109	228	**2686**
500-600	507	363	252	247	1055	224	2648

		Southbound					Westbound (NH 28)			Northbound (Ex 5 NB Off-Ramp)				Eastbound (NH 28)				
Time Period	**Class.**	**I**	**O**	**R**	**T**	**U**	**I**	**O**	**R**	**T**	**L**	**I**	**O**	**T**	**L**	**U**	**I**	**O**	**Total**
Peak 1	Lights	0	715	498	388	0	886	1295	211	0	194	405	0	1084	217	0	1301	582	2592
Specified Period	%	0%	96%	97%	97%	0%	97%	97%	95%	0%	92%	94%	0%	98%	93%	0%	97%	95%	97%
4:00 PM - 6:00 PM	Other Vehicles	0	28	17	13	0	30	37	12	0	16	28	0	25	11	0	36	29	94
One Hour Peak	%	0%	4%	3%	3%	0%	3%	3%	5%	0%	8%	6%	0%	2%	5%	0%	3%	5%	3%
4:45 PM - 5:45 PM	**Total**	**0**	**743**	**515**	**401**	**0**	**916**	**1332**	**223**	**0**	**210**	**433**	**0**	**1109**	**228**	**0**	**1337**	**611**	**2686**
	PHF	0	0.89	0.91	0.9	0	0.91	0.91	0.66	0	0.67	0.67	0	0.93	0.84	0	0.92	0.88	0.94
	Approach %	0%	28%				34%	50%				16%	0%				50%	23%	

Project: Exit 4a SDEIS

Loc 4 Location: **Exit 5 SB ramps**

Growth rates:

Annual 2014->2015 **1.025**

2016->2015 **0.975**

Seasonal:

	AM Peak	PM Peak
May-16 Adj Factor=	**0.96**	**0.98**

Total Adjustments:		AM Peak	PM Peak
	2014->2015	**0.984**	**1.0045**
	2016->2015	**0.936**	**0.9555**

		2016- Raw		**2016 - AADT**				**2015 - AADT**				**2015 - AWDT- Balanced from TMC and ATRs**			
		AM Peak (730-830)	PM Peak (445-545)	AM Peak (730-830)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (730-830)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (730-830)	Approach Totals	PM Peak (445-545)	Approach Totals
EB	LT	0	0	0	661	0	870	0	645	0	848	0	795	0	930
	Thru	463	641	444		628		433		612		515		650	
	RT	226	247	217		242		212		236		280		280	
WB	LT	192	116	184	796	114	586	179	776	111	571	235	840	135	625
	Thru	638	482	612		472		597		460		605		490	
	RT	0	0	0		0		0		0		0		0	
NB	LT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Thru	0	0	0		0		0		0		0		0	
	RT	0	0	0		0		0		0		0		0	
SB	LT	496	690	476	782	676	957	464	762	659	933	465	760	645	910
	Thru	0	0	0		0		0		0		0		0	
	RT	319	287	306		281		298		274		295		265	
	total	2334	2463	2239	2239	2413	2413	2183	2183	2352	2352	2395	2395	2465	2465

Use Seasonal Factor

Use Annual Factor

Balance to NB ramp

		ramp total			SB		WB		EB		
					RT	LT	TH	LT	RT	TH	Total
0.41	0.59	595	700-800		242	353	660	235	225	325	2160
0.4	0.6	726	715-815		287	439	673	211	223	359	2298
0.39	0.61	815	**730-830**		319	496	638	192	226	351	**2334**
0.38	0.62	885	745-845		333	552	604	155	206	463	2288
0.38	0.62	870	800-900		329	541	534	126	198	438	2167

			Southbound (Ex 5 SB Off-Ramp)					Westbound (NH 28)					Northbound		Eastbound (NH 28)					
Time Period	**Class.**		**R**	**T**	**L**	**I**	**O**	**T**	**L**	**U**	**I**	**O**	**I**	**O**	**R**	**T**	**U**	**I**	**O**	**Total**
Peak 1	Lights		301	0	467	768	0	589	179	0	768	863	0	377	198	396	0	594	890	2130
Specified Period	%		94%	0%	94%	94%	0%	92%	93%	0%	93%	90%	0%	90%	88%	86%	0%	86%	93%	91%
7:00 AM - 9:15 AM	Other Vehicles		18	0	29	47	0	49	13	0	62	96	0	41	28	67	0	95	67	204
One Hour Peak	%		6%	0%	6%	6%	0%	8%	7%	0%	7%	10%	0%	10%	12%	14%	0%	14%	7%	9%
7:30 AM - 8:30 AM	**Total**		**319**	**0**	**496**	**815**	**0**	**638**	**192**	**0**	**830**	**959**	**0**	**418**	**226**	**463**	**0**	**689**	**957**	**2334**
	PHF		0.72	0	0.76	0.74	0	0.72	0.76	0	0.73	0.89	0	0.84	0.9	0.93	0	0.92	0.82	0.89
	Approach %					35%	0%				36%	41%	0%	18%				30%	41%	

	SB		WB		EB		
	RT	LT	TH	LT	RT	TH	Total
400-500	237	579	459	125	248	441	2233
415-515	262	597	424	119	275	458	2306
430-530	284	650	440	116	271	470	2409
445-545	287	690	482	116	247	648	2463
500-600	266	625	499	114	236	641	2390

			Southbound (Ex 5 SB Off-Ramp)					Westbound (NH 28)					Northbound		Eastbound (NH 28)					
Time Period	**Class.**		**R**	**T**	**L**	**I**	**O**	**T**	**L**	**U**	**I**	**O**	**I**	**O**	**R**	**T**	**U**	**I**	**O**	**Total**
Peak 1	Lights		267	2	672	941	0	452	115	0	567	1293	0	349	232	621	0	853	719	2361
Specified Period	%		93%	100%	97%	96%	0%	94%	99%	0%	95%	97%	0%	96%	94%	97%	0%	96%	93%	95%
4:00 PM - 6:15 PM	Other Vehicles		20	0	18	38	0	30	1	0	31	38	0	16	15	20	0	35	50	104
One Hour Peak	%		7%	0%	3%	4%	0%	6%	1%	0%	5%	3%	0%	4%	6%	3%	0%	4%	7%	4%
4:45 PM - 5:45 PM	**Total**		**287**	**2**	**690**	**979**	**0**	**482**	**116**	**0**	**598**	**1331**	**0**	**365**	**247**	**641**	**0**	**888**	**769**	**2465**
	PHF		0.91	0.5	0.91	0.91	0	0.87	0.83	0	0.86	0.9	0	0.81	0.74	0.9	0	0.87	0.9	0.91
	Approach %					40%	0%				24%	54%	0%	15%				36%	31%	

Project: Exit 4a SDEIS
Loc 5 Location: **NH 102-Londonderry Rd**

Growth rates:
Annual 2014->2015 **1.025**
2016->2015 **0.975**

Seasonal:
Intersection Turning Movement Counts

May-16 Adj Factor= AM Peak **0.96** PM Peak **0.98**

		2016- Raw		2016 - AADT				2015 - AADT				2015 - AADT- Rounded			
		AM Peak (715-815)	PM Peak (445-545)	AM Peak (730-830)	Approach Totals	PM Peak (430-530)	Approach Totals	AM Peak (715-815)	Approach Totals	PM Peak (430-530)	Approach Totals	AM Peak (715-815)	Approach Totals	PM Peak (430-530)	Approach Totals
EB	LT	80	298	77	612	292	1392	75	597	285	1358	75	600	285	1355
	Thru	556	996	534		976		521		952		520		950	
	RT	1	127	1		124		1		121		5		120	
WB	LT	1	1	1	1148	1	776	1	1119	1	757	5	1120	5	760
	Thru	1167	752	1120		737		1092		719		1090		720	
	RT	28	39	27		38		26		37		25		35	
NB	LT	0	3	0	1	3	7	0	1	3	7	0	1	5	10
	Thru	0	1	0		1		0		1		0		0	
	RT	1	3	1		3		1		3		1		5	
SB	LT	12	9	12	119	9	143	12	116	9	140	10	115	10	145
	Thru	0	1	0		1		0		1		0		5	
	RT	111	136	107		133		104		130		105		130	
	total	1957	2366	1880	1880	2318	2318	1833	1833	2262	2262	1836	1836	2270	2270

Use Seasonal Factor

Use Annual Factor
Balance to SB ramp

	WB			NB			EB			SB			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	Total
700-800													2738
715-815	**28**	**1167**	**1**	**1**	**0**	**0**	**1**	**556**	**80**	**111**	**0**	**12**	**1957**
730-830													2850
745-845													2820
800-900													2705

		Southbound (Londonderry Rd.)						Westbound (NH 102)						Northbound (St. Charles St.)						Eastbound (NH 102)						
Time Period	Class.	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total
Peak 1	Lights	105	0	11	0	116	96	27	1119	1	0	1147	523	1	0	0	0	1	2	1	511	69	0	581	1224	1845
Specified Period	%	95%	0%	92%	0%	94%	89%	96%	96%	100%	0%	96%	92%	100%	0%	0%	0%	100%	100%	100%	92%	86%	0%	91%	96%	94%
7:00 AM - 9:15 AM	Other Vehicles	6	0	1	0	7	12	1	48	0	0	49	46	0	0	0	0	0	0	0	45	11	0	56	54	112
One Hour Peak	%	5%	0%	8%	0%	6%	11%	4%	4%	0%	0%	4%	8%	0%	0%	0%	0%	0%	0%	0%	8%	14%	0%	9%	8%	6%
7:15 AM - 8:15 AM	**Total**	**111**	**0**	**12**	**0**	**123**	**108**	**28**	**1167**	**1**	**0**	**1196**	**569**	**1**	**0**	**0**	**0**	**1**	**2**	**1**	**556**	**80**	**0**	**637**	**1278**	**1957**
	PHF	0.9	0	0.75	0	0.88	0.82	0.78	0.89	0.25	0	0.91	0.89	0.25	0	0	0	0.25	0.5	0.25	0.9	0.83	0	0.89	0.9	0.95
	Approach %					6%	6%					61%	29%					0%	0%					33%	65%	

	WB			NB			EB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
400-500													0
415-515													0
430-530													0
445-545	**1**	**752**	**39**	**3**	**1**	**3**	**298**	**996**	**127**	**9**	**1**	**136**	**2366**
500-600													0

		Southbound (Londonderry Rd.)						Westbound (NH 102)						Northbound (St. Charles St.)						Eastbound (NH 1002)						
Time Period	Class.	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total
Peak 1	Lights	134	1	8	0	143	330	38	739	1	0	778	995	3	1	3	0	7	127	125	984	291	0	1400	876	2328
Specified Period	%	99%	100%	89%	0%	98%	98%	97%	99%	100%	0%	98%	99%	100%	100%	100%	0%	100%	98%	98%	99%	98%	0%	99%	98%	98%
4:00 PM - 6:15 PM	Other Vehicles	2	0	1	0	3	8	1	13	0	0	14	13	0	0	0	0	0	2	2	12	7	0	21	15	38
One Hour Peak	%	1%	0%	11%	0%	2%	2%	3%	2%	0%	0%	2%	1%	0%	0%	0%	0%	0%	2%	2%	1%	2%	0%	1%	2%	2%
4:45 PM - 5:45 PM	**Total**	**136**	**1**	**9**	**0**	**146**	**338**	**39**	**752**	**1**	**0**	**792**	**1008**	**3**	**1**	**3**	**0**	**7**	**129**	**127**	**996**	**298**	**0**	**1421**	**891**	**2366**
	PHF	0.83	0.25	0.75	0	0.83	0.9	0.89	0.94	0.25	0	0.95	0.96	0.38	0.25	0.75	0	0.58	0.81	0.79	0.96	0.88	0	0.97	0.94	0.97
	Approach %					6%	14%					33%	43%					0%	5%					60%	38%	

Project: Exit 4a SDEIS
Loc: 6 Location: NH 102-Fordway - High St

Growth rates:
Annual 2014->2015 1.025
2016->2015 0.975

Seasonal:
Intersection Turning Movement Counts

		May-16		AM Peak Adj Factor=	PM Peak 0.96	0.98									
		2016- Raw		2016 - AADT				2015 - AADT				2015 - AADT- Rounded				
		AM Peak (715-815)	PM Peak (430-530)	AM Peak (715-815)	Approach Totals	PM Peak (430-530)	Approach Totals	AM Peak (715-815)	Approach Totals	PM Peak (430-530)	Approach Totals	AM Peak (715-815)	Approach Totals	PM Peak (430-530)	Approach Totals	
EB	LT	0	0	0	539	0	933	0	526	0	910	0	525	0	910	EB
	Thru	428	795	411		779		401		760		400		760		
	RT	133	157	128		154		125		150		125		150		
WB	LT	14	14	13	622	14	440	13	607	14	429	15	610	15	430	WB
	Thru	634	435	609		426		594		415		595		415		
	RT	0	0	0		0		0		0		0		0		
NB	LT	369	241	354	428	236	337	345	417	230	328	345	415	230	330	NB
	Thru	0	0	0		0		0		0		0		0		
	RT	77	103	74		101		72		98		70		100		
SB	LT	7	15	7	42	15	69	7	41	15	68	5	40	15	70	SB
	Thru	28	52	27		51		26		50		25		50		
	RT	8	3	8		3		8		3		10		5		
	Total	1698	1815	1631	1631	1779	1779	1591	1591	1735	1735	1590	1590	1740	1740	

CHECK E-W APPRAOCHES =

2015 Peak Hour Link Volumes based on TMC

Approach		AM Peak Inbound	AM Peak Outbound	AM Peak Total	PM Peak Inbound	PM Peak Outbound	PM Peak Total	2015 AADT	Adjusted 2015 AM Pk	Adjusted 2015 PM Pk	% AADT in AM Pk	% AADT in PM Pk
North	High St N of Broadway	40	0	40	70	0	70	15568	786	1104	0.26%	0.45%
South	Fordway S of 102	415	165	580	330	215	545	7576			5.46%	7.19%
East	NH 102 WB, E. of Fordway	610	950	1560	430	650	1080	15012			5.46%	7.19%
West	NH 102 EB, W of Fordway	525	475	1000	910	875	1785	24812			5.46%	7.19%
		1590	1590	3180	1740	1740	3480					

Notes: Adjusted 2015 AADT based on ATR counts for comparison purposes
Calculated 2015 AADT based on AM/PM k factors in red
k factors based on ratio of TMC volumes compared to adjusted 2015 AADT from ATR data

Use Seasonal Factor

Use Annual Factor
Balance to NB ramp

	SB			WB		NB			EB		
	LT	TH	RT	LT	TH	LT	TH	RT	TH	RT	Total
700-800											0
715-815	7	28	8	14	634	369	0	77	428	133	1698
730-830											0
745-845											0
800-900											0

Time Period	Class	Southbound (Madden Hill Rd.) R	T	L	U	O	Westbound (NH 102) T	L	U	I	O	Northbound (Fordway) R	L	U	I	O	Eastbound (NH 102) R	T	U	I	O	Total		Crosswalk Pedestrians	Total
Peak 1	Lights	8	27	7	42	0	605	13	0	618	467	71	362	0	433	165	525	389	0	914	975	1807	SB	0	0
Specified Period	%	100%	96%	100%	98%	0%	95%	93%	0%	95%	95%	92%	98%	0%	97%	94%	94%	91%	0%	93%	96%	95%		0%	
7:00 AM - 9:15 AM	Other Vehicles	0	1	0	1	0	29	1	0	30	45	6	7	0	13	10	8	39	0	47	36	91	WB	0	0
One Hour Peak	%	0%	4%	0%	2%	0%	5%	7%	0%	5%	5%	8%	2%	0%	3%	6%	6%	9%	0%	8%	4%	5%		0%	
7:15 AM - 8:15 AM	Total	8	28	7	43	0	634	14	0	648	512	77	369	0	446	175	133	428	0	561	1011	1698	NB	0	0
	PHF	0.67	0.58	0.44	0.6	0	0.87	0.58	0	0.86	0.88	0.88	0.92	0	0.96	0.84	0.9	0.89	0	0.89	0.89	0.95		0%	
	Approach %				3%	0%				38%	30%				26%	10%				33%	60%		EB	0	0
																								0%	
																								0	0

	SB			WB		NB			EB		
	LT	TH	RT	LT	TH	LT	RT	TH	RT	Total	
400-500										0	
415-515										0	
430-530	15	52	3	14	435	241	103	795	157	1815	
445-545										0	
500-600										0	

Time Period	Class	Southbound (Madden Hill Rd.) R	T	L	U	O	Westbound (NH 102) T	L	U	I	O	Northbound (Fordway) R	L	U	I	O	Eastbound (NH 102) R	T	U	I	O	Total		Crosswalk Pedestrians	Total
Peak 1	Lights	3	51	15	69	0	422	14	0	436	898	102	239	0	341	220	155	781	0	936	664	1782	SB	0	0
Specified Period	%	100%	98%	100%	99%	0%	97%	100%	0%	97%	98%	99%	99%	0%	99%	99%	99%	98%	0%	98%	98%	98%		0%	
4:00 PM - 6:15 PM	Other Vehicles	0	1	0	1	0	13	0	0	13	15	1	2	0	3	3	2	14	0	16	15	33	WB	0	0
One Hour Peak	%	0%	2%	0%	1%	0%	3%	0%	0%	3%	2%	1%	1%	0%	1%	1%	1%	2%	0%	2%	2%	2%		0%	
4:30 PM - 5:30 PM	Total	3	52	15	70	0	435	14	0	449	913	103	241	0	344	223	157	795	0	952	679	1815	NB	1	1
	PHF	0.38	0.76	0.62	0.83	0	0.89	0.88	0	0.89	0.96	0.92	0.9	0	0.98	0.83	0.73	0.97	0	0.95	0.93	0.97		100%	
	Approach %				4%	0%				25%	50%				19%	12%				52%	37%		EB	0	0
																								0%	
																								1	1

Loc 7 Project: Exit 4a SDEIS
Location: NH 102 NH 28

Growth rates:

Annual	2014->2015	1.025
	2016->2015	0.975

Seasonal

Intersection Turning Movement Counts

		AM Peak	PM Peak
May-16	Adj Factor=	0.96	0.98

		2016- Raw		2016 - AADT				2015 - AADT				2015 - AADT- Rounded				
		AM Peak (745-845)	PM Peak (445-545)	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals	
EB	LT	110	142	106	374	139	598	103	365	136	584	105	370	135	585	EB
	Thru	218	429	209		420		204		410		205		410		
	RT	61	40	59		39		58		38		60		40		
WB	LT	40	81	38	518	79	404	37	505	77	394	35	500	75	390	WB
	Thru	412	262	396		257		386		251		385		250		
	RT	87	69	84		68		82		66		80		65		
NB	LT	62	75	60	370	74	411	59	361	72	400	60	360	70	400	NB
	Thru	280	307	269		301		262		293		260		295		
	RT	43	37	41		36		40		35		40		35		
SB	LT	76	144	73	416	141	645	71	405	137	628	70	405	135	625	SB
	Thru	246	358	236		351		230		342		230		340		
	RT	111	156	107		153		104		149		105		150		
	total	1746	2100	1678	1678	2058	2058	1636	1636	2006	2006	1635	1635	2000	2000	

Use Seasonal Factor

Use Annual Factor

Balance to SB ramp

2015 Peak Hour Link Volumes based on TMC

Approach		AM Peak Inbound	AM Peak Outbound	AM Peak Total	PM Peak Inbound	PM Peak Outbound	PM Peak Total	2015 AADT	Adjusted 2015 AM Pk	Adjusted 2015 PM Pk	% AADT in AM Pk	% AADT in PM Pk
North	Crystal N of Broadway	405	445	850	625	495	1120	15568	786	1104	5.46%	7.19%
South	Birch S of Broadway	360	325	685	400	455	855	11885			5.46%	7.19%
East	NH 102 WB, E. of NH 28	500	550	1050	390	470	860	11954			5.46%	7.19%
West	NH 102 EB, W of NH 28	370	315	685	585	580	1165	16194			5.46%	7.19%
		1635	1635	3270	2000	2000	4000					

Notes - Adjusted 2015 AADT based on ATR counts for comparison purposes
Calculated 2015 AADT based on AM/PM k factors in red
k factors based on ratio of TMC volumes compared to adjusted 2015 AADT from ATR data

	SB			WB			NB			EB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
700-800													0
715-815													0
730-830													0
745-845	**76**	**246**	**111**	**40**	**412**	**87**	**62**	**280**	**43**	**110**	**218**	**61**	**1746**
800-900													0

		Southbound (NH 28)						Westbound (NH 102)						Northbound (NH 28)				Eastbound (NH 102)							Crosswalk	
Time Period	Class	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total		Pedestrian	Total
Peak 1	Lights	106	228	73	0	407	453	85	391	32	0	508	306	41	265	58	0	364	319	59	192	103	0	354	555	1633	SB	0	0
Specified Period	%	96%	98%	96%	0%	96%	95%	88%	95%	80%	0%	96%	91%	95%	95%	94%	0%	95%	92%	97%	88%	95%	0%	91%	95%	94%		0%	
7:00 AM - 9:15 AM	Other Vehicles	5	18	3	0	26	24	2	21	8	0	31	31	2	15	4	0	21	28	2	26	7	0	35	30	113	WB	0	0
One Hour Peak	%	5%	7%	4%	0%	6%	5%	2%	5%	20%	0%	6%	9%	5%	5%	6%	0%	5%	8%	3%	12%	5%	0%	9%	5%	6%		0%	
7:45 AM - 8:45 AM	Total	**111**	**246**	**76**	**0**	**433**	**477**	**87**	**412**	**40**	**0**	**539**	**337**	**43**	**280**	**62**	**0**	**385**	**347**	**61**	**218**	**110**	**0**	**389**	**585**	**1746**	NB	1	1
	PHF	0.92	0.87	0.86	0	0.91	0.95	0.84	0.91	0.77	0	0.94	0.89	0.67	0.93	0.67	0	0.88	0.89	0.85	0.94	0.79	0	0.96	0.94	0.96		100%	
	Approach %					55%	37%					37%	19%					22%	19%					22%	34%		EB	0	0
																												0%	
																												1	1

	SB			WB			NB			EB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
400-500													0
415-515													0
430-530													0
445-545	**144**	**358**	**156**	**81**	**262**	**69**	**75**	**307**	**37**	**142**	**429**	**40**	**2100**
500-600													0

		Southbound (NH 28)						Westbound (NH 102)						Northbound (NH 28)				Eastbound (NH 102)							Crosswalk	
Time Period	Class	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total		Pedestrian	Total
Peak 1	Lights	155	356	144	0	653	504	69	258	79	0	406	605	35	290	74	0	405	473	38	426	139	0	603	487	2069	SB	5	5
Specified Period	%	99%	99%	100%	0%	100%	97%	100%	98%	96%	0%	99%	99%	95%	98%	99%	0%	99%	99%	95%	99%	98%	0%	99%	99%	99%		100%	
4:00 PM - 6:15 PM	Other Vehicles	1	7	0	0	3	14	0	4	2	0	6	5	2	11	1	0	14	6	2	8	3	0	8	6	11	WB	0	0
One Hour Peak	%	1%	1%	0%	0%	0%	3%	0%	2%	2%	0%	1%	1%	5%	4%	1%	0%	3%	1%	5%	1%	2%	0%	2%	1%	1%		0%	
4:45 PM - 5:45 PM	Total	**156**	**358**	**144**	**0**	**658**	**518**	**69**	**262**	**81**	**0**	**412**	**610**	**37**	**307**	**75**	**0**	**419**	**479**	**40**	**429**	**142**	**0**	**611**	**493**	**2100**	NB	2	2
	PHF	0.91	0.88	0.8	0	0.93	0.96	0.75	0.95	0.92	0	0.94	0.96	0.84	0.92	0.75	0	0.91	0.87	0.73	0.93	0.93	0	0.95	0.91	0.97		100%	
	Approach %					31%	25%					20%	29%					20%	23%					29%	23%		EB	3	3
																												100%	
																												10	10

Project: Exit 4a SDEIS

Loc **8** Location: **North High St at Ash St Ext**

Growth rates:

Annual	2014->2015	**1.025**
	2016->2015	**0.975**

Seasonal:

Intersection Turning Movement Counts

		AM Peak	PM Peak
May-16	Adj Factor=	**0.96**	**0.98**

		2016- Raw		**2016 - AADT**				**2015 - AADT**				**2015 - AADT- Rounded**			
		AM Peak (730-830)	PM Peak (500-600)	AM Peak (730-830)	Approach Totals	PM Peak (500-600)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals
EB	LT	190	442	182	191	433	439	177	186	422	428	180	190	420	425
	Thru	0	0	0		0		0		0		0		0	
	RT	9	6	9		6		9		6		10		5	
WB	LT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Thru	0	0	0		0		0		0		0		0	
	RT	0	0	0		0		0		0		0		0	
NB	LT	3	2	3	129	2	298	3	126	2	291	5	130	5	295
	Thru	131	302	126		296		123		289		125		290	
	RT	0	0	0		0		0		0		0		0	
SB	LT	0	0	0	414	0	442	0	404	0	431	0	405	0	435
	Thru	184	175	177		172		173		168		175		170	
	RT	247	276	237		270		231		263		230		265	
	total	764	1203	734	734	1179	1179	716	716	1150	1150	725	725	1155	1155

Use Seasonal Factor

Use Annual Factor
Balance to NB ramp

	SB		NB		EB		
	TH	RT	TH	LT	RT	LT	Total
700-800							0
715-815							0
730-830	184	247	131	3	9	190	**764**
745-845							0
800-900							0

		Southbound (N. High St.)					**Northbound (N. High St.)**					**Eastbound (Ash St. Ext.)**					
Time Period	**Class.**	**R**	**T**	**U**	**I**	**O**	**T**	**L**	**U**	**I**	**O**	**R**	**L**	**U**	**I**	**O**	**Total**
Peak 1	Lights	244	177	0	421	307	126	2	0	128	186	9	181	0	190	246	739
Specified Perio	%	99%	96%	0%	98%	96%	96%	67%	0%	96%	96%	100%	95%	0%	95%	98%	97%
7:00 AM - 9:15 A	Other Vehicles	3	7	0	10	14	5	1	0	6	7	0	9	0	9	4	25
One Hour Peal	%	1%	4%	0%	2%	4%	4%	33%	0%	4%	4%	0%	5%	0%	5%	2%	3%
7:30 AM - 8:30 A	**Total**	**247**	**184**	**0**	**431**	**321**	**131**	**3**	**0**	**134**	**193**	**9**	**190**	**0**	**199**	**250**	**764**
	PHF	0.76	0.82	0	0.93	0.89	0.89	0.75	0	0.91	0.85	0.38	0.86	0	0.89	0.76	0.92
	Approach %				56%	42%				18%	25%				26%	33%	

	SB		NB		EB		
	TH	RT	LT	TH	LT	RT	Total
400-500							0
415-515							0
430-530							0
445-545							0
500-600	**175**	**276**	**2**	**302**	**442**	**6**	**1203**

Loc **8** Location: **North High St at Ash St Ext**

		Southbound (N. High St.)					Northbound (N. High St.)					Eastbound (Ash St. Ext.)					
Time Period	**Class.**	**R**	**T**	**U**	**I**	**O**	**T**	**L**	**U**	**I**	**O**	**R**	**L**	**U**	**I**	**O**	**Total**
Peak 1	Lights	273	173	0	446	735	296	2	0	298	179	6	439	0	445	275	1189
Specified Period	%	99%	99%	0%	99%	99%	98%	100%	0%	98%	99%	100%	99%	0%	99%	99%	99%
4:00 PM - 6:15 PM	Other Vehicles	3	2	0	5	9	6	0	0	6	2	0	3	0	3	3	14
One Hour Peak	%	1%	1%	0%	1%	1%	2%	0%	0%	2%	1%	0%	1%	0%	1%	1%	1%
5:00 PM - 6:00 PM	**Total**	**276**	**175**	**0**	**451**	**744**	**302**	**2**	**0**	**304**	**181**	**6**	**442**	**0**	**448**	**278**	**1203**
	PHF	0.9	0.74	0	0.87	0.94	0.87	0.5	0	0.87	0.75	0.5	0.9	0	0.9	0.89	0.93
	Approach %				37%	62%				25%	15%				37%	23%	

Project: Exit 4a SDEIS

Loc **9** Location: **High St at Madden Rd**

Growth rates:

Annual	2014->2015	**1.025**
	2016->2015	**0.975**

Seasonal:

Intersection Turning Movement Counts

	AM Peak	PM Peak
May-16 Adj Factor=	**0.96**	**0.98**

		2016- Raw		**2016 - AADT**				**2015 - AADT**				**2015 - AADT- Rounded**			
		AM Peak (730-830)	PM Peak (500-600)	AM Peak (730-830)	Approach Totals	PM Peak (500-600)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals
EB	LT	12	12	12	14	12	16	12	14	12	16	10	10	10	10
	Thru	0	0	0		0		0		0		0		0	
	RT	2	4	2		4		2		4		0		0	
WB	LT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Thru	0	0	0		0		0		0		0		0	
	RT	0	0	0		0		0		0		0		0	
NB	LT	0	3	0	313	3	725	0	305	3	707	0	310	0	700
	Thru	326	737	313		722		305		704		310		700	
	RT	0	0	0		0		0		0		0		0	
SB	LT	0	0	0	428	0	456	0	418	0	445	0	420	0	450
	Thru	428	460	411		451		401		440		400		440	
	RT	18	5	17		5		17		5		20		10	
	total	786	1221	755	755	1197	1197	737	737	1168	1168	740	740	1160	1160

Use Seasonal Factor

Use Annual Factor
Balance to NB ramp

	SB TH	SB RT	NB TH	NB LT	EB RT	EB LT	Total
700-800							0
715-815							0
730-830	**428**	**18**	**326**	**0**	**2**	**12**	**786**
745-845							0
800-900							0

		Southbound (N. High St.)					**Northbound (N. High St.)**					**Eastbound (Madden Rd.)**					
Time Period	**Class.**	**R**	**T**	**U**	**I**	**O**	**T**	**L**	**U**	**I**	**O**	**R**	**L**	**U**	**I**	**O**	**Total**
Peak 1	Lights	4	417	0	421	314	313	0	0	313	419	2	1	0	3	4	737
Specified Period	%	22%	97%	0%	94%	93%	96%	0%	0%	96%	97%	100%	8%	0%	21%	22%	94%
7:00 AM - 9:00 AM	Other Vehicles	14	11	0	25	24	13	0	0	13	11	0	11	0	11	14	49
One Hour Peak	%	78%	3%	0%	6%	7%	4%	0%	0%	4%	3%	0%	92%	0%	79%	78%	6%
7:30 AM - 8:30 AM	**Total**	**18**	**428**	**0**	**446**	**338**	**326**	**0**	**0**	**326**	**430**	**2**	**12**	**0**	**14**	**18**	**786**
	PHF	0.56	0.95	0	0.96	0.9	0.95	0	0	0.95	0.95	0.5	0.38	0	0.44	0.56	0.94
	Approach %				57%	43%				41%	55%				2%	2%	

Loc 9 Location: **High St at Madden Rd**

	SB		NB		EB		
	TH	RT	TH	LT	RT	LT	Total
400-500							0
415-515							0
430-530							0
445-545							0
500-600	**460**	**5**	**737**	**3**	**4**	**12**	**1221**

		Southbound (N. High St.)					Northbound (N. High St.)					Eastbound (Madden Rd.)					
Time Period	**Class.**	**R**	**T**	**U**	**I**	**O**	**T**	**L**	**U**	**I**	**O**	**R**	**L**	**U**	**I**	**O**	**Total**
Peak 1	Lights	5	454	0	459	738	727	3	0	730	458	4	11	0	15	8	1204
Specified Period	%	100%	99%	0%	99%	99%	99%	100%	0%	99%	99%	100%	92%	0%	94%	100%	99%
4:00 PM - 6:15 PM	Other Vehicles	0	6	0	6	11	10	0	0	10	6	0	1	0	1	0	17
One Hour Peak	%	0%	1%	0%	1%	1%	1%	0%	0%	1%	1%	0%	8%	0%	6%	0%	1%
5:00 PM - 6:00 PM	**Total**	**5**	**460**	**0**	**465**	**749**	**737**	**3**	**0**	**740**	**464**	**4**	**12**	**0**	**16**	**8**	**1221**
	PHF	0.62	0.85	0	0.86	0.93	0.94	0.38	0	0.93	0.86	0.33	0.6	0	0.5	0.5	0.94
	Approach %				38%	61%				61%	38%				1%	1%	

Project: Exit 4a SDEIS

Loc 10 Location: **N High St -Folsom Rd-Franklin St**

Growth rates:

Annual	2014->2015	1.025
	2016->2015	0.975

Seasonal:

Intersection Turning Movement Counts

	AM Peak	PM Peak
May-16	Adj Factor= 0.96	0.98

		2016- Raw		2016 - AADT				2015 - AADT				2015 - AADT- Rounded			
		AM Peak (730-830)	PM Peak (500-600)	AM Peak (730-830)	Approach Totals	PM Peak (500-600)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals
EB	LT	38	46	36	321	45	731	35	313	44	713	35	310	45	715
	Thru	291	696	279		682		272		665		270		665	
	RT	6	4	6		4		6		4		5		5	
WB	LT	31	33	30	436	32	437	29	425	31	426	30	425	30	425
	Thru	411	393	395		385		385		375		385		375	
	RT	11	20	11		20		11		20		10		20	
NB	LT	7	4	7	47	4	65	7	46	4	64	10	50	5	65
	Thru	5	10	5		10		5		10		5		10	
	RT	36	52	35		51		34		50		35		50	
SB	LT	12	18	12	46	18	98	12	45	18	96	10	45	20	100
	Thru	4	10	4		10		4		10		5		10	
	RT	31	71	30		70		29		68		30		70	
	total	883	1357	850	850	1331	1331	829	829	1299	1299	830	830	1305	1305

Use Seasonal Factor

Use Annual Factor

Balance to NB ramp

	SB			WB			NB			EB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
700-800													
715-815													
730-830	12	4	31	31	411	11	7	5	36	38	291	6	**883**
745-845													
800-900													

		Southbound (Franklin St. Ext.)						Westbound (Folsom Rd.)						Northbound (Franklin St.)						Eastbound (N. High St.)						
Time Period	Class	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total
Peak 1	Lights	30	4	12	0	46	52	10	389	30	0	429	339	36	5	7	0	48	38	4	271	37	0	312	426	835
Specified Period	%	97%	100%	100%	0%	98%	96%	91%	95%	97%	0%	95%	94%	100%	100%	100%	0%	100%	93%	67%	93%	92%	0%	93%	95%	95%
7:00 AM - 9:15 AM	Other Vehicles:	1	0	0	0	1	2	1	22	1	0	24	20	0	0	0	0	0	3	2	20	3	0	23	23	48
One Hour Peak	%	3%	0%	0%	0%	2%	4%	9%	5%	3%	0%	5%	6%	0%	0%	0%	0%	0%	7%	33%	7%	8%	0%	7%	5%	5%
7:30 AM - 8:30 AM	Total	31	4	12	0	47	54	11	411	31	0	453	339	36	5	7	0	48	41	6	291	38	0	335	449	883
	PHF	0.78	0.5	0.5	0	0.65	0.68	0.34	0.97	0.7	0	0.95	0.85	0.69	0.31	0.44	0	0.67	0.85	0.38	0.9	0.79	0	0.89	0.96	0.89
	Approach %					5%	6%					51%	38%					5%	5%					38%	51%	

	SB			WB			NB			EB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
400-500													0
415-515													0
430-530													0
445-545													0
500-600	18	10	71	33	393	20	4	10	52	46	696	4	**1357**

		Southbound (Franklin St. Ext.)						Westbound (Folsom Rd.)						Northbound (Franklin St.)						Eastbound (N. High St.)						
Time Period	Class	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total
Peak 1	Lights	71	10	18	0	99	73	19	387	33	0	439	760	52	10	4	0	66	47	4	690	44	0	738	462	1342
Specified Period	%	100%	100%	100%	0%	100%	96%	95%	98%	100%	0%	98%	99%	100%	100%	100%	0%	100%	100%	100%	99%	96%	0%	99%	99%	99%
4:00 PM - 6:15 PM	Other Vehicles:	0	0	0	0	0	3	1	6	0	0	7	6	0	0	0	0	0	0	0	6	2	0	8	6	15
One Hour Peak	%	0%	0%	0%	0%	0%	4%	5%	2%	0%	0%	2%	1%	0%	0%	0%	0%	0%	0%	0%	1%	4%	0%	1%	1%	1%
5:00 PM - 6:00 PM	Total	71	10	18	0	99	76	20	393	33	0	446	766	52	10	4	0	66	47	4	696	46	0	746	468	1357
	PHF	0.66	0.62	0.64	0	0.67	0.73	0.62	0.89	0.59	0	0.88	0.92	0.72	0.42	0.5	0	0.82	0.65	0.33	0.93	0.77	0	0.94	0.85	0.94
	Approach %					7%	6%					33%	56%					5%	3%					55%	34%	

Project: Exit 4a SDEIS
Loc: 11 Location: **Folsom Rd-NH 28 (Ross' Corner)**

Growth rates:
Annual 2014 >2015 **1.025**
2016 >2015 **0.975**

Seasonal:
Intersection Turning Movement Counts

	AM Peak	PM Peak
May 16 Adj Factor=	**0.96**	**0.98**

		2016- Raw		2016 - AADT				2015 - AADT				2015 - AADT- Rounded			
		AM Peak (745-845)	PM Peak (400-500)	AM Peak (745-845)	Approach Totals	PM Peak (500-600)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals
Folsom EB	LT	140	539	134	325	528	993	131	317	515	968	135	325	520	965
	Thru	177	399	170		391		166		381		170		375	
	RT	22	76	21		74		20		72		20		70	
Tsienneto WB	LT	130	150	125	809	147	762	122	789	143	742	125	785	140	740
	Thru	312	391	300		383		293		373		290		370	
	RT	400	237	384		232		374		226		370		230	
NH 28 S NB	LT	19	233	18	387	228	830	18	378	222	809	20	385	220	800
	Thru	242	401	232		393		226		383		230		380	
	RT	143	213	137		209		134		204		135		200	
NH 28 N SB	LT	327	561	314	679	550	1176	306	661	536	1146	310	675	525	1135
	Thru	230	239	221		225		215		219		220		220	
	RT	150	409	144		401		140		391		145		390	
	total	2292	3839	2200	2200	3761	3761	2145	2145	3665	3665	2170	2170	3640	3640

Use Seasonal Factor Use Annual Factor
Balance to NB ramp

2015 Peak Hour Link Volumes based on TMC

Approach		AM Peak Inbound	AM Peak Outbound	PM Peak Inbound	PM Peak Outbound	2015 AADT	% AADT in AM Pk	% AADT in PM Pk
North	NH 28 N of Folsom	675	735	1135	1130			
South	NH 28 S of Folsom	385	365	800	430			
East	Tsienneto E of 28	785	615	740	1100			
West	Folsom W of NH 28	125	455	965	980			
		2170	2170	3640	3640			

	SB				WB				NB				EB		Total
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT		
700-800	146	215	333	381	323	116	141	237	29	30	169	126		2246
715-815	159	206	323	399	306	112	126	234	20	21	156	123		2189
730-830	151	233	315	406	302	126	125	227	15	25	178	137		2240
745-845	**150**	**230**	**327**	**400**	**312**	**130**	**143**	**242**	**19**	**22**	**177**	**140**		**2292**
800-900	140	220	308	401	287	144	140	247	14	17	167	145		2230

Time Period	Class	Southbound (NH 28) R	T	L	U	I	O	Westbound (Tsienneto Rd.) R	T	L	U	I	O	Northbound (NH 28) R	T	L	U	I	O	Eastbound (Folsom Rd.) R	T	L	U	I	O	Total		Crosswalk Pedestrians	Total
Peak 1	Lights	147	214	309	0	670	755	391	298	130	0	819	623	142	228	17	0	387	365	21	172	136	0	129	462	2205	SB	0	0
Specified Period	%	98%	92%	96%	0%	95%	97%	98%	96%	100%	0%	97%	95%	99%	99%	89%	0%	96%	98%	95%	97%	97%	0%	97%	96%	96%		0%	
7:00 AM - 9:00 AM	Other Vehicles	3	16	18	0	37	27	9	14	0	0	23	24	1	14	2	0	17	17	1	5	4	0	10	19	87	WB	5	5
One Hour Peak	%	2%	7%	4%	0%	5%	3%	2%	4%	0%	0%	3%	4%	1%	6%	11%	0%	4%	5%	5%	3%	3%	0%	3%	4%	4%		100%	
7:45 AM - 8:45 AM	**Total**	**150**	**230**	**327**	**0**	**707**	**782**	**400**	**312**	**130**	**0**	**842**	**647**	**143**	**242**	**19**	**0**	**404**	**382**	**22**	**177**	**140**	**0**	**339**	**481**	**2292**	NB	4	4
	PHF	0.77	0.83	0.77	0	0.79	0.95	0.96	0.96	0.93	0	0.99	0.84	0.85	0.86	0.53	0	0.84	0.85	0.55	0.88	0.9	0	0.86	0.88	0.9		100%	
	Approach %					31%	34%					33%	28%					18%	17%					15%	21%		EB	1	1
																												100%	
																												10	10

	SB				WB				NB				EB		Total
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT		
400-500	409	230	554	230	379	146	213	401	233	76	394	539		3804
415-515	392	246	583	208	376	150	209	418	221	77	394	526		3800
430-530	369	253	553	204	383	160	202	395	228	78	413	532		3770
445-545	345	235	548	207	372	157	212	372	247	83	397	516		3691
500-600	327	227	584	201	374	167	197	375	248	88	391	541		3720

Time Period	Class	Southbound (NH 28) R	T	L	U	I	O	Westbound (Tsienneto Rd) R	T	L	U	I	O	Northbound (NH 28) R	T	L	U	I	O	Eastbound (Folsom Rd) R	T	L	U	I	O	Total		Crosswalk Pedestrians	Total
Peak 1	Lights	398	220	550	0	1168	1153	229	372	144	0	745	1152	212	392	229	0	833	439	75	390	532	1	998	1000	3744	SB	0	0
Specified Period	%	97%	98%	99%	0%	98%	99%	100%	98%	99%	0%	99%	99%	100%	98%	98%	0%	98%	97%	99%	99%	99%	100%	99%	98%	98%		100%	
4:00 PM - 6:00 PM	Other Vehicles	11	10	4	0	25	16	1	7	2	0	10	9	1	9	4	0	14	13	1	4	6	0	11	22	60	WB	1	1
One Hour Peak	%	3%	5%	1%	0%	2%	1%	0%	2%	1%	0%	1%	1%	0%	2%	2%	0%	2%	3%	1%	1%	1%	0%	1%	2%	2%		100%	
5:00 PM - 5:00 PM	**Total**	**409**	**230**	**554**	**0**	**1193**	**1169**	**230**	**379**	**146**	**0**	**755**	**1161**	**213**	**401**	**233**	**0**	**847**	**452**	**76**	**394**	**538**	**1**	**1009**	**1022**	**3804**	NB	1	1
	PHF	0.95	0.85	0.87	0	0.94	0.93	0.88	0.9	0.79	0	0.95	0.94	0.78	0.84	0.79	0	0.92	0.86	0.76	0.94	0.95	0.25	0.97	0.9	0.98		100%	
	Approach %					31%	31%					30%	31%					22%	12%					27%	27%		EB	0	0
																												0%	
																												8	8

Project: Exit 4a SDEIS

Loc **12** Location: **Tsienneto Rd-Pinkerton St**

Growth rates:

Annual	2014->2015	**1.025**
	2016->2015	**0.975**

Seasonal:

Intersection Turning Movement Counts

	AM Peak	PM Peak
May-16 Adj Factor=	**0.96**	**0.98**

		2016- Raw		**2016 - AADT**				**2015 - AADT**				**2015 - AWDT- Rounded**			
		AM Peak (700-800)	PM Peak (400-500)	AM Peak (700-800)	Approach Totals	PM Peak (500-600)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals
EB	LT	0	0	0	635	0	1151	0	619	0	1122	0	620	0	1125
	Thru	399	690	383		676		373		659		375		660	
	RT	263	485	252		475		246		463		245		465	
WB	LT	84	118	81	661	116	693	79	645	113	676	80	645	115	680
	Thru	604	589	580		577		566		563		565		565	
	RT	0	0	0		0		0		0		0		0	
NB	LT	231	189	222	303	185	307	216	295	180	299	215	295	180	300
	Thru	0	0	0		0		0		0		0		0	
	RT	84	124	81		122		79		119		80		120	
SB	LT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Thru	0	0	0		0		0		0		0		0	
	RT	0	0	0		0		0		0		0		0	
	total	1665	2195	1599	1599	2151	2151	1559	1559	2097	2097	1560	1560	2105	2105

Use Seasonal Factor

Use Annual Factor
Balance to NB ramp

	WB	NB		EB		
	TH	LT	LT	RT	TH	RT	Total
700-800	**578**	**98**	**237**	**105**	**432**	**248**	**1698**
715-815	565	73	235	81	414	231	1599
730-830	595	79	237	74	417	231	1633
745-845	604	84	231	84	399	263	1665
800-900	574	90	243	75	387	254	1623

		Westbound (Tsienneto Rd.)					**Northbound (Pinkerton St.)**					**Eastbound (Tsienneto Rd.)**					
Time Period	**Class.**	**T**	**L**	**U**	**I**	**O**	**R**	**L**	**U**	**I**	**O**	**R**	**T**	**U**	**I**	**O**	**Total**
Peak 1	Lights	568	95	0	663	527	104	232	0	336	334	239	423	0	662	800	1661
Specified Period	%	98%	97%	0%	98%	98%	99%	98%	0%	98%	97%	96%	98%	0%	97%	98%	98%
7:00 AM - 9:15 AM	Other Vehicles	10	3	0	13	10	1	5	0	6	12	9	9	0	18	15	37
One Hour Peak	%	2%	3%	0%	2%	2%	1%	2%	0%	2%	3%	4%	2%	0%	3%	2%	2%
7:00 AM - 8:00 AM	**Total**	**578**	**98**	**0**	**676**	**537**	**105**	**237**	**0**	**342**	**346**	**248**	**432**	**0**	**680**	**815**	**1698**
	PHF	0.9	0.49	0	0.81	0.88	0.58	0.85	0	0.83	0.71	0.82	0.89	0	0.86	0.94	0.87
	Approach %				40%	32%				20%	20%				40%	48%	

Loc **12** Location: **Tsienneto Rd-Pinkerton St**

	WB		NB		EB		
	LT	TH	LT	RT	TH	RT	Total
400-500	**589**	**118**	**189**	**124**	**690**	**485**	**2195**
415-515	592	118	190	113	675	494	2182
430-530	601	119	189	101	674	495	2179
445-545	564	105	195	107	661	502	2134
500-600	552	101	196	96	686	502	2133

		Westbound (Tsienneto Rd)					Northbound (Pinkerton St)					Eastbound (Tsienneto Rd)					
Time Period	**Class.**	**T**	**L**	**U**	**I**	**O**	**R**	**L**	**U**	**I**	**O**	**R**	**T**	**U**	**I**	**O**	**Total**
Peak 1	Lights	581	117	0	698	808	124	186	0	310	598	481	684	0	1165	767	2173
Specified Period	%	99%	99%	0%	99%	99%	100%	98%	0%	99%	99%	99%	99%	0%	99%	99%	99%
4:00 PM - 6:15 PM	Other Vehicles	8	1	0	9	6	0	3	0	3	5	4	6	0	10	11	22
One Hour Peak	%	1%	1%	0%	1%	1%	0%	2%	0%	1%	1%	1%	1%	0%	1%	1%	1%
4:00 PM - 5:00 PM	**Total**	**589**	**118**	**0**	**707**	**814**	**124**	**189**	**0**	**313**	**603**	**485**	**690**	**0**	**1175**	**778**	**2195**
	PHF	0.86	0.78	0	0.85	0.93	0.78	0.93	0	0.86	0.9	0.89	0.96	0	0.96	0.9	0.96
	Approach %				37%	37%				14%	27%				54%	35%	

Project: Exit 4a SDEIS
Loc 13 Location: **NH 28-Linlew Drive**

Growth rates:

Annual	2014->2015	**1.025**
	2016->2015	**0.975**

Seasonal:

Intersection Turning Movement Counts

		AM Peak	PM Peak
May-16	Adj Factor=	**0.96**	**0.98**

		2016- Raw		2016 - AADT				2015 - AADT				2015 - AADT- Rounded			
		AM Peak (745-845)	PM Peak (445-545)	AM Peak (745-845)	Approach Totals	PM Peak (500-600)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals
EB	LT	55	177	53	864	173	1610	52	843	169	1570	50	840	170	1575
	Thru	845	1464	811		1435		791		1399		790		1400	
	RT	0	2	0		2		0		2		0		5	
WB	LT	0	18	0	702	18	978	0	684	18	954	0	685	20	955
	Thru	699	897	671		879		654		857		655		855	
	RT	32	83	31		81		30		79		30		80	
NB	LT	2	13	2	3	13	36	2	3	13	36	5	10	15	40
	Thru	0	9	0		9		0		9		0		10	
	RT	1	14	1		14		1		14		5		15	
SB	LT	54	49	52	304	48	277	51	297	47	270	50	295	45	270
	Thru	0	8	0		8		0		8		0		10	
	RT	262	226	252		221		246		215		245		215	
	total	1950	2960	1873	1873	2901	2901	1827	1827	2830	2830	1830	1830	2840	2840

Use Seasonal Factor

Use Annual Factor
Balance to NB ramp

2015 Peak Hour Link Volumes based on TMC

Approach		AM Peak Inbound	AM Peak Outbound	PM Peak Inbound	PM Peak Outbound	2015 AADT	% AADT in AM PK	% AADT in PM PK
North	NH 28 N of Linlew	840	905	1575	1085			
South	NH 28 S of Linlew	685	845	955	1460			
East	Linlew E of NH 28	295	80	270	260			
West	Applebees	10	0	40	35			
		1830	1830	2840	2840			

NOTE- : EB = NH 28 SB
WB = NH 28 NB
SB = Linlew
NB = Applebees

	SB			WB			NB			EB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
700-800													2160
715-815													2298
730-830													**0**
745-845	54	0	262	0	699	32	2	0	1	55	845	0	**1950**
800-900													2167

		Southbound (Linlew Dr.)						Westbound (NH 28)						Northbound (Applebees Driveway)						Eastbound (NH 28)							Crosswalk	
Time Period	Class.	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total		Pedestrians	Total
Peak 1	Lights	260	0	54	0	314	84	80	672	0	0	702	837	1	0	2	1	4	2	0	782	54	2	838	996	1858	SB	0	0
Specified Period	%	99%	0%	100%	0%	99%	99%	96%	96%	0%	0%	99%	93%	100%	0%	100%	100%	100%	100%	0%	99%	98%	100%	99%	99%	99%		0%	
7:00 AM - 9:15 AM	Other Vehicles	2	0	0	0	2	3	2	27	0	0	29	63	0	0	0	0	0	0	0	63	1	0	64	29	93	WB	0	0
One Hour Peak	%	1%	0%	0%	0%	1%	1%	4%	4%	0%	0%	1%	7%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	1%	1%	1%		0%	
7:45 AM - 8:45 AM	**Total**	**262**	**0**	**54**	**0**	**316**	**87**	**82**	**699**	**0**	**0**	**731**	**900**	**1**	**0**	**2**	**1**	**4**	**2**	**0**	**845**	**55**	**2**	**902**	**955**	**1953**	NB	0	0
	PHF	0.91	0	0.84	0	0.9	0.87	0.71	0.98	0	0	0.98	0.82	0.25	0	0.5	0.25	0.5	0.25	0	0.82	0.76	0.5	0.83	0.96	0.89		0%	
	Approach %					16%	4%					17%	21%					0%	0%					46%	49%		EB	0	0
																												0%	
																												0	0

	SB			WB			NB			EB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
400-500													0
415-515													0
430-530													0
445-545	**49**	**8**	**226**	**18**	**897**	**83**	**13**	**9**	**14**	**177**	**1464**	**2**	**2960**
500-600													0

		Southbound (Linlew Dr.)						Westbound (NH 28)						Northbound (Applebees Driveway)						Eastbound (NH 28)							Crosswalk	
Time Period	Class.	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total		Pedestrians	Total
Peak 1	Lights	225	8	48	0	281	266	82	866	18	1	983	1506	13	9	13	0	56	48	2	1443	175	1	1621	1125	2925	SB	0	0
Specified Period	%	100%	100%	89%	0%	99%	99%	99%	99%	100%	100%	99%	99%	100%	100%	100%	0%	100%	100%	100%	99%	99%	100%	99%	99%	99%		0%	
4:00 PM - 6:00 PM	Other Vehicles	1	0	1	0	3	3	1	11	0	0	12	22	0	0	0	0	0	0	0	21	2	0	23	12	37	WB	0	0
One Hour Peak	%	0%	0%	1%	0%	1%	1%	1%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	1%	1%	1%		0%	
5:15 PM - 5:45 PM	**Total**	**226**	**8**	**49**	**0**	**283**	**269**	**83**	**897**	**18**	**1**	**999**	**1528**	**14**	**9**	**13**	**0**	**56**	**48**	**2**	**1464**	**177**	**1**	**1644**	**1137**	**2962**	NB	0	0
	PHF	0.84	0.5	0.68	0	0.8	0.85	0.83	0.96	0.75	0.25	0.95	0.96	0.88	0.75	0.81	0	0.8	0.7	0.5	0.97	0.82	0.25	0.97	0.94	0.95		0%	
	Approach %					10%	9%					34%	52%					1%	1%					56%	38%		EB	0	0
																												0%	
																												0	0

Project: Exit 4a SDEIS
Loc 14 Location: NH 28-Ashleigh Dr

Growth rates:
Annual 2014->2015 1.025
2016->2015 0.975

Seasonal:
Intersection Turning Movement Counts

		AM Peak	PM Peak
May-16	Adj Factor=	0.96	0.98

		2016- Raw		2016 - AADT				2015 - AADT				2015 - AADT- Rounded			
		AM Peak (745-845)	PM Peak (430-530)	AM Peak (745-845)	Approach Totals	PM Peak (500-600)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals
EB	LT	105	113	101	751	111	1237	98	732	108	1206	100	735	110	1210
	Thru	671	1147	644		1124		628		1096		630		1095	
	RT	5	2	6		2		6		2		5		5	
WB	LT	6	3	6	859	3	1089	6	837	3	1061	5	835	5	1065
	Thru	652	838	626		821		610		800		610		800	
	RT	236	270	227		265		221		258		220		260	
NB	LT	8	40	8	16	39	55	8	16	38	54	10	20	40	60
	Thru	6	8	6		8		6		8		5		10	
	RT	2	8	2		8		2		8		5		10	
SB	LT	194	359	186	291	352	490	181	284	343	478	180	285	345	485
	Thru	5	1	5		1		5		1		5		5	
	RT	104	140	100		137		98		134		100		135	
	total	1995	2929	1917	1917	2871	2871	1869	1869	2799	2799	1875	1875	2820	2820

NOTE- EB = NH 28 SB — Use Seasonal Factor — Use Annual Factor — Use these in Synchro Existing Cond analyses
WB = NH 28 NB
SB = Ashleigh Dr
NB = VIP Driveway

	SB			WB			NB			EB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
700-800													0
715-815													0
730-830													0
745-845	194	5	104	6	652	236	8	6	2	105	571	6	1995
800-900													0

		Southbound (Ashleigh Dr.)						Westbound (NH 28)						Northbound (VIP Driveway)						Eastbound (NH 28)								Crosswalk	
Time Period	Class:	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total		Pedestrian:	Total
Peak 1	Lights	103	4	186	0	293	333	225	625	6	3	859	816	2	6	8	0	16	16	6	625	102	0	733	736	1901	SB	1	1
Specified Period	%	99%	80%	95%	0%	97%	96%	95%	96%	100%	100%	96%	94%	100%	100%	100%	0%	100%	64%	100%	93%	97%	0%	94%	96%	95%		100%	
7:00 AM - 9:15 AM	Other Vehicles	1	1	8	0	10	14	11	27	0	0	38	54	0	0	0	0	0	1	0	46	3	0	49	28	97	WB	0	0
One Hour Peak	%	1%	20%	4%	0%	3%	4%	5%	4%	0%	0%	4%	6%	0%	0%	0%	0%	0%	6%	0%	7%	3%	0%	6%	4%	5%		0%	
7:45 AM - 8:45 AM	Total	104	5	194	0	303	347	236	652	6	3	897	870	2	6	8	0	16	17	6	671	105	0	782	764	1998	NB	0	0
	PHF	0.79	0.42	0.9	0	0.9	0.92	0.91	0.96	0.75	0.75	0.97	0.85	0.5	0.56	0.5	0	0.67	0.53	0.5	0.81	0.77	0	0.83	0.96	0.91		0%	
	Approach %					15%	17%					45%	44%					1%	1%					39%	38%		EB	1	1
																												100%	
																												2	2

	SB			WB			NB			EB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
400-500													0
415-515													0
430-530	359	1	140	3	838	270	40	8	8	113	1147	2	2929
445-545													0
500-600													0

		Southbound (Ashleigh Dr.)						Westbound (NH 28)						Northbound (VIP Driveway)						Eastbound (NH 28)								Crosswalk	
Time Period	Class:	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total		Pedestrian:	Total
Peak 1	Lights	139	1	358	0	498	388	269	819	3	13	1104	1511	8	8	40	0	56	6	2	1132	111	1	1246	999	2904	SB	1	1
Specified Period	%	99%	100%	100%	0%	100%	99%	100%	98%	100%	100%	98%	99%	100%	100%	100%	0%	100%	100%	100%	95%	98%	100%	99%	98%	99%		100%	
4:00 PM - 6:15 PM	Other Vehicles	1	0	1	0	2	3	1	19	0	0	20	16	0	0	0	0	0	0	0	15	2	0	17	20	39	WB	0	0
One Hour Peak	%	1%	0%	0%	0%	0%	1%	0%	2%	0%	0%	2%	1%	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	1%	2%	1%		0%	
4:30 PM - 5:30 PM	Total	140	1	359	0	500	391	270	838	3	13	1124	1527	8	8	40	0	56	6	2	1147	113	1	1263	1019	2943	NB	0	0
	PHF	0.83	0.25	0.87	0	0.86	0.97	0.95	0.89	0.38	0.65	0.9	0.83	0.5	0.5	0.77	0	0.78	0.5	0.5	0.81	0.91	0.25	0.84	0.91	0.88		0%	
	Approach %					17%	13%					38%	52%					2%	0%					43%	35%		EB	0	0
																												0%	
																												1	1

Project: Exit 4a SDEIS

Loc **15** Location: **NH 28-Scobie Pond Rd**

Growth rates:

Annual	2014->2015	**1.025**
	2016->2015	**0.975**

Seasonal:

Intersection Turning Movement Counts

	AM Peak	PM Peak
May-16 Adj Factor=	**0.96**	**0.98**

		2016- Raw		**2016 - AADT**				**2015 - AADT**				**2015 - AADT- Rounded**			
		AM Peak (730-830)	PM Peak (430-530)	AM Peak (730-830)	Approach Totals	PM Peak (500-600)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals
EB	LT	17	42	16	752	41	1193	16	734	40	1163	15	735	40	1165
	Thru	767	1175	736		1152		718		1123		720		1125	
	RT	0	0	0		0		0		0		0		0	
WB	LT	0	0	0	701	0	880	0	683	0	858	0	685	0	860
	Thru	689	733	661		718		644		700		645		700	
	RT	42	165	40		162		39		158		40		160	
NB	LT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Thru	0	0	0		0		0		0		0		0	
	RT	0	0	0		0		0		0		0		0	
SB	LT	83	74	80	116	73	103	78	113	71	100	80	115	70	100
	Thru	0	0	0		0		0		0		0		0	
	RT	37	31	36		30		35		29		35		30	
	total	1635	2220	1569	1569	2176	2176	1530	1530	2121	2121	1535	1535	2125	2125

Use Seasonal Factor | Use Annual Factor | Use these in Synchro Existing Cond analyses

	SB		WB		EB		
	LT	RT	TH	RT	LT	TH	Total
700-800							0
715-815							0
730-830	**83**	**37**	**689**	**42**	**17**	**767**	**1635**
745-845							0
800-900							0

		Southbound (Scobie Pond Rd.)					**Westbound (NH 28)**					**Eastbound (NH 28)**					
Time Period	**Class.**	**R**	**L**	**U**	**I**	**O**	**R**	**T**	**U**	**I**	**O**	**T**	**L**	**U**	**I**	**O**	**Total**
Peak 1	Lights	36	77	0	113	47	37	668	0	705	796	719	10	0	729	704	1547
Specified Period	%	97%	93%	0%	94%	80%	88%	97%	0%	96%	94%	94%	59%	0%	93%	97%	95%
7:00 AM - 9:15 AM	Other Vehicles	1	6	0	7	12	5	21	0	26	54	48	7	0	55	22	88
One Hour Peak	%	3%	7%	0%	6%	20%	12%	3%	0%	4%	6%	6%	41%	0%	7%	3%	5%
7:30 AM - 8:30 AM	**Total**	**37**	**83**	**0**	**120**	**59**	**42**	**689**	**0**	**731**	**850**	**767**	**17**	**0**	**784**	**726**	**1635**
	PHF	0.84	0.83	0	0.83	0.82	0.88	0.89	0	0.89	0.85	0.85	0.53	0	0.84	0.89	0.9
	Approach %				7%	4%				45%	52%				48%	44%	

Loc **15** Location: **NH 28-Scobie Pond Rd**

	SB		WB		EB		
	LT	RT	TH	RT	LT	TH	Total
400-500							0
415-515							0
430-530	**74**	**31**	**733**	**165**	**42**	**1175**	**2220**
445-545							0
500-600							0

		Southbound (Scobie Pond Rd.)					Westbound (NH 28)					Eastbound (NH 28)					
Time Period	**Class.**	**R**	**L**	**U**	**I**	**O**	**R**	**T**	**U**	**I**	**O**	**T**	**L**	**U**	**I**	**O**	**Total**
Peak 1	Lights	28	74	0	102	205	164	717	1	882	1232	1157	41	1	1199	746	2183
Specified Period	%	90%	100%	0%	97%	99%	99%	98%	100%	98%	99%	98%	98%	100%	98%	98%	98%
4:00 PM - 6:15 PM	Other Vehicles	3	0	0	3	2	1	16	0	17	18	18	1	0	19	19	39
One Hour Peak	%	10%	0%	0%	3%	1%	1%	2%	0%	2%	1%	2%	2%	0%	2%	2%	2%
4:30 PM - 5:30 PM	**Total**	**31**	**74**	**0**	**105**	**207**	**165**	**733**	**1**	**899**	**1250**	**1175**	**42**	**1**	**1218**	**765**	**2222**
	PHF	0.78	0.74	0	0.75	0.94	0.9	0.9	0.25	0.9	0.91	0.9	0.81	0.25	0.91	0.92	0.96
	Approach %				5%	9%				40%	56%				55%	34%	

Project: Exit 4a SDEIS

101 **16** Location: **NH 102-NH 28 Bypass (Rotary)**

Growth rates:

Annual	2014 -> 2015	**1.025**
	2016 -> 2015	**0.975**

Seasonal

Intersection Turning Movement Counts

			AM Peak	PM Peak
May-16		Adj Factor=	**0.96**	**0.98**

		2016- Raw		2016 - AADT				2015 - AADT				2015 - AADT- Rounded			
		AM Peak (700-800)	PM Peak (500-600)	AM Peak (730-830)	Approach Totals	PM Peak (500-600)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals
EB	LT	64	39	61	376	38	630	59	367	37	614	60	370	40	620
	Thru	122	254	122		249		119		243		120		245	
	RT	98	276	94		270		92		263		90		265	
	RT	103	74	99		73		97		71		100		70	
WB	LT	1	9	1	330	9	240	1	322	9	234	1	330	10	240
	LT	79	62	76		61		74		58		75		60	
	Thru	251	136	241		133		235		129		240		130	
	RT	12	17	12		17		12		17		10		20	
NB	LT	78	76	75	560	74	442	73	373	72	431	75	375	70	475
	Thru	263	280	252		274		246		267		245		265	
	RT	53	90	49		88		48		86		50		85	
	RT	4	6	4		6		4		6		5		5	
SB	LT	17	13	16	453	13	754	16	443	13	735	15	445	15	740
	LT	128	393	123		385		120		375		120		375	
	Thru	266	328	255		321		249		313		250		315	
	RT	61	36	59		35		58		34		60		35	
NWB	LT	8	12	8	479	12	230	8	468	12	494	10	470	10	495
	LT	176	202	169		198		165		193		165		195	
	RT	301	282	289		276		282		269		280		270	
	RT	14	20	13		20		13		20		15		20	
	Total	2102	2625	2018	2018	2572	2296	1971	1971	2508	2508	1990	1990	2520	2520

Use Seasonal Factor | Use Annual Factor | Use these in Synchro Existing Cond analyses

	SB			EB			NB			NWB (E. Derry Rd)			WB			
	LT (NH 102 E)	LT (E. Derry Rd)	TH (Byp 28)	RT (NH 102 W)	LT (Byp 28 N)	TH (NH 102)	RT (E. Derry Rd)	RT (Byp 28 S)	LT (NH 102 W)	TH (Byp 28)	RT (NH 102 E)	RT (E Derry Rd)	LT (Byp 28 S)	LT (NH 102 W)	RT (Byp 28 N)	RT (NH 102 E)	LT (E. Derry Rd)	LT (Byp 28 S)	TH (NH 102 W)	RT (Byp 28 N)	Total
700-800	**17**	**128**	**266**	**61**	**64**	**122**	**98**	**103**	**78**	**263**	**51**	**4**	**8**	**176**	**303**	**14**	**1**	**79**	**251**	**12**	**2102**
715-815																					0
730-830																					0
745-845																					0
800-900																					0

	Southbound (NH 28 Byp.)							Westbound (NH 102)							Northwestbound (East Derry Rd.)							Northbound (NH 28 Byp.)							Eastbound (NH 102)						
Time Period	**Class.**	**R**	**T**	**BL**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**HL**	**U**	**I**	**O**	**HR**	**BR**	**BL**	**HL**	**U**	**I**	**O**	**HR**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**BR**	**T**	**L**	**U**	**I**	**O**	**Total**
Peak 1	Lights	57	255	159	8	1	441	628	11	233	74	1	0	319	171	33	294	170	8	1	485	218	1	43	261	76	0	381	416	98	94	109	61	1	463	537	2992
Specified Period	%	63%	96%	83%	47%	50%	96%	98%	92%	93%	94%	100%	0%	93%	82%	97%	98%	97%	100%	100%	97%	94%	75%	84%	99%	97%	0%	97%	96%	95%	96%	98%	98%	100%	84%	95%	95%
7:00 AM - 9:15 AM	Other Vehicles	4	10	9	9	1	33	14	1	16	5	0	1	25	17	1	7	6	0	0	14	14	1	8	2	2	0	13	20	5	4	10	3	0	30	30	115
One Hour Peak	%	7%	4%	5%	53%	50%	7%	2%	8%	7%	3%	0%	100%	7%	10%	3%	2%	3%	0%	0%	3%	6%	25%	16%	1%	3%	0%	3%	4%	5%	4%	9%	5%	0%	6%	5%	3%
7:00 AM - 8:00 AM	**Total**	**61**	**266**	**168**	**17**	**2**	**474**	**642**	**12**	**249**	**79**	**1**	**1**	**344**	**188**	**34**	**301**	**176**	**8**	**1**	**500**	**232**	**2**	**51**	**263**	**78**	**0**	**394**	**436**	**103**	**98**	**119**	**64**	**1**	**493**	**567**	**2102**
	PHF	0.53	0.69	0.94	0.89	0.5	0.8	0.81	0.75	0.86	0.79	0.25	0.25	0.69	0.77	0.88	0.93	0.89	0.67	0.25	0.91	0.88	0.33	0.71	0.81	0.78	0	0.86	0.77	0.44	0.72	0.74	0.44	0.25	0.9	0.9	0.46
	Approach %						22%	30%						16%	30%						23%	11%						19%	22%						19%	27%	

	SB			EB			NB			NWB (E. Derry Rd)			WB			
	LT (NH 102 E)	LT (E. Derry Rd)	TH (Byp 28)	RT (NH 102 W)	LT (Byp 28 N)	TH (NH 102)	RT (E. Derry Rd)	RT (Byp 28 S)	LT (NH 102 W)	TH (Byp 28)	RT (NH 102 E)	RT (E Derry Rd)	LT (Byp 28 S)	LT (NH 102 W)	RT (Byp 28 N)	RT (NH 102 E)	LT (E Derry Rd)	LT (Byp 28 S)	TH (NH 102 W)	RT (Byp 28 N)	Total
400-500																					0
415-515																					0
430-530																					0
445-545																					0
500-600	**13**	**393**	**328**	**36**	**39**	**254**	**275**	**74**	**78**	**280**	**90**	**6**	**12**	**202**	**252**	**20**	**9**	**62**	**156**	**17**	**2625**

	Southbound (NH 28 Bypass)							Westbound (NH 102)							North-westbound (East Derry Rd.)							Northbound (NH 28 Bypass)							Eastbound (NH 102)						
Time Period	**Class.**	**R**	**T**	**BL**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**HL**	**U**	**I**	**O**	**HR**	**BR**	**BL**	**HL**	**U**	**I**	**O**	**HR**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**BR**	**T**	**L**	**U**	**I**	**O**	**Total**
Peak 1	Lights	36	323	337	13	1	760	610	17	153	60	9	0	259	372	19	279	200	12	0	510	677	6	89	274	76	0	445	458	73	275	251	39	1	639	499	3393
Specified Period	%	100%	98%	98%	100%	100%	99%	99%	100%	98%	83%	100%	0%	98%	99%	0%	99%	99%	100%	0%	99%	99%	100%	99%	98%	100%	0%	99%	98%	99%	100%	99%	100%	100%	99%	99%	99%
4:00 PM - 6:15 PM	Other Vehicles	0	5	6	0	0	11	9	0	3	2	0	0	5	5	1	3	2	0	0	6	7	0	1	6	0	0	7	8	1	1	3	0	0	5	5	54
One Hour Peak	%	0%	2%	2%	0%	0%	1%	1%	0%	2%	1%	0%	0%	2%	1%	1%	1%	1%	0%	0%	1%	1%	0%	1%	2%	0%	0%	2%	2%	1%	0%	1%	0%	0%	1%	1%	2%
5:00 PM - 5:00 PM	**Total**	**36**	**328**	**353**	**13**	**1**	**771**	**619**	**17**	**156**	**62**	**9**	**0**	**244**	**377**	**20**	**282**	**202**	**12**	**0**	**516**	**684**	**6**	**90**	**280**	**76**	**0**	**452**	**476**	**74**	**276**	**254**	**39**	**1**	**644**	**471**	**2677**
	PHF	0.75	0.85	0.84	0.65	0.25	0.92	0.92	0.71	0.91	0.82	0.56	0	0.91	0.94	0.83	0.93	0.9	0.43	0	0.91	0.92	0.5	0.25	0.83	0.76	0	0.87	0.84	0.97	0.9	0.88	0.81	0.25	0.9	0.91	0.97
	Approach %						39%	24%						9%	15%						22%	28%						17%	18%						25%	18%	

Project: Exit 4a SDEIS

Loc 17 Location: **NH 28 Bypass-Pinkerton St - Nesmith Rd**

Growth rates:

Annual	2014->2015	**1.025**
	2016->2015	**0.975**

Seasonal:

Intersection Turning Movement Counts

	AM Peak	PM Peak
May-16 Adj Factor=	**0.96**	**0.98**

		2016- Raw		2016 - AADT				2015 - AADT				2015 - AADT- Rounded			
		AM Peak (700-800)	PM Peak (400-500)	AM Peak (730-830)	Approach Totals	PM Peak (500-600)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals
EB	LT	12	9	12	217	9	494	12	212	9	482	10	210	10	485
	Thru	15	42	14		41		14		40		15		40	
	RT	199	453	191		444		186		433		185		435	
WB	LT	6	1	6	98	1	55	6	96	1	53	5	95	5	55
	Thru	43	33	41		32		40		31		40		30	
	RT	53	22	51		22		50		21		50		20	
NB	LT	262	210	252	656	206	659	246	640	201	643	245	640	200	645
	Thru	418	455	401		446		391		435		390		435	
	RT	3	7	3		7		3		7		5		10	
SB	LT	11	24	11	320	24	335	11	312	23	327	10	310	25	330
	Thru	273	304	262		298		255		291		255		290	
	RT	49	13	47		13		46		13		45		15	
	total	1344	1573	1291	1291	1543	1543	1260	1260	1505	1505	1255	1255	1515	1515

Use Seasonal Factor | Use Annual Factor | Use these in Synchro Existing Cond analyses

	SB			WB			NB			EB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
700-800	**11**	**273**	**49**	**6**	**43**	**53**	**262**	**418**	**3**	**12**	**15**	**199**	**1344**
715-815													0
730-830													0
745-845													0
800-900													0

		Southbound (NH 28 Byp.)						Westbound (Nesmith St.)						Northbound (NH 28 Byp.)						Eastbound (Pinkerton St.)						
Time Period	**Class.**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**Total**
Peak 1	Lights	49	261	10	0	320	468	52	41	4	0	97	25	5	404	254	0	661	449	184	12	12	0	208	344	1286
Specified Period	%	100%	96%	91%	0%	96%	97%	98%	95%	67%	0%	95%	86%	100%	97%	97%	0%	97%	94%	92%	80%	100%	0%	92%	97%	96%
7:00 AM - 9:15 AM	Other Vehicles	0	12	1	0	13	15	1	2	2	0	5	4	0	14	8	0	22	29	15	3	0	0	18	10	58
One Hour Peak	%	0%	4%	9%	0%	4%	3%	2%	5%	33%	0%	5%	14%	0%	3%	3%	0%	3%	6%	8%	20%	0%	0%	8%	3%	4%
7:00 AM - 8:00 AM	**Total**	**49**	**273**	**11**	**0**	**333**	**483**	**53**	**43**	**6**	**0**	**102**	**29**	**3**	**418**	**262**	**0**	**683**	**478**	**199**	**15**	**12**	**0**	**226**	**354**	**1344**
	PHF	0.31	0.59	0.69	0	0.52	0.64	0.34	0.63	0.75	0	0.45	0.81	0.38	0.72	0.81	0	0.75	0.67	0.8	0.62	0.75	0	0.82	0.64	0.65
	Approach %					25%	36%					8%	2%					51%	36%					17%	26%	

	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
400-500	**24**	**304**	**13**	**1**	**33**	**22**	**210**	**455**	**7**	**9**	**42**	**453**	**1573**
415-515													0
430-530													0
445-545													0
500-600													0

		Southbound (NH 28 Bypass)						Westbound (Nesmith St.)						Northbound (NH 28 Bypass)						Eastbound (Pinkerton St.)						
Time Period	**Class.**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**Total**
Peak 1	Lights	13	299	24	0	336	477	22	33	1	0	56	73	7	446	209	0	662	744	444	42	9	0	495	255	1549
Specified Period	%	100%	98%	100%	0%	99%	98%	100%	100%	100%	0%	100%	100%	100%	98%	100%	0%	99%	98%	98%	100%	100%	0%	98%	100%	98%
4:00 PM - 6:15 PM	Other Vehicles	0	5	0	0	5	9	0	0	0	0	0	0	0	9	1	0	10	14	9	0	0	0	9	1	24
One Hour Peak	%	0%	2%	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	2%	2%	0%	0%	0%	2%	0%	2%
4:00 PM - 5:00 PM	**Total**	**13**	**304**	**24**	**0**	**341**	**486**	**22**	**33**	**1**	**0**	**56**	**73**	**7**	**455**	**210**	**0**	**672**	**758**	**453**	**42**	**9**	**0**	**504**	**256**	**1573**
	PHF	0.65	0.88	0.75	0	0.91	0.95	0.69	0.92	0.25	0	0.82	0.83	0.58	0.91	0.92	0	0.93	0.93	0.83	0.88	0.56	0	0.88	0.94	0.95
	Approach %					22%	31%					4%	5%					43%	48%					32%	16%	

Project: Exit 4a SDEIS
Loc 18 Location: NH 28 Bypass-Tslenneto Rd.

Growth rates:

Annual		
	2014->2015	1.025
	2016->2015	0.975

Seasonal:

Intersection Turning Movement Counts

					AM Peak	PM Peak
		May-16		Adj Factor=	0.96	0.98

		2016- Raw		2016 - AADT				2015 - AADT				2015 - AADT- Rounded			
		AM Peak (700-800)	PM Peak (500-600)	AM Peak (730-830)	Approach Totals	PM Peak (500-600)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals
EB	LT	123	294	118	303	288	717	115	295	281	699	120	300	280	700
	Thru	105	359	101		352		98		343		100		345	
	RT	88	79	84		77		82		75		80		75	
WB	LT	88	29	84	453	28	278	82	442	27	271	80	440	25	270
	Thru	287	184	276		180		269		176		270		175	
	RT	97	71	93		70		91		68		90		70	
NB	LT	104	103	100	346	101	451	98	338	98	439	100	340	100	445
	Thru	238	333	228		326		222		318		220		320	
	RT	19	24	18		24		18		23		20		25	
SB	LT	27	79	26	504	77	457	25	491	75	445	25	490	75	445
	Thru	223	194	214		190		209		185		210		185	
	RT	275	194	264		190		257		185		255		185	
	total	1674	1943	1606	1606	1903	1903	1566	1566	1854	1854	1570	1570	1860	1860

Use Seasonal Factor | Use Annual Factor | Use these in Synchro Existing Cond analyses.

	SB			WB			NB			EB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
700-800	27	223	275	88	287	97	104	238	19	123	105	88	1674
715-815													0
730-830													0
745-845													0
800-900													0

		Southbound (NH 28 Bypass)						Westbound (Tslenneto Rd.)						Northbound (NH 28 Bypass)						Eastbound (Tslenneto Rd.)								Crosswalk	
Time Period	Class.	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total		Pedestrian	Total
Peak 1	Lights	266	211	27	0	504	448	97	286	86	1	470	148	18	232	99	0	349	389	66	102	119	0	309	651	1632	SB	0	0
Specified Period	%	97%	95%	100%	0%	96%	98%	100%	100%	98%	100%	99%	97%	95%	97%	95%	0%	97%	96%	100%	97%	97%	0%	98%	99%	97%		0%	
7:00 AM - 9:15 AM	Other Vehicles	9	12	0	0	21	10	0	1	2	0	3	4	1	6	5	0	12	14	0	3	4	0	7	15	43	WB	0	0
One Hour Peak	%	3%	5%	0%	0%	4%	2%	0%	0%	2%	0%	1%	3%	5%	3%	5%	0%	3%	4%	0%	3%	3%	0%	2%	4%	3%		0%	
7:00 AM - 8:00 AM	Total	275	223	27	0	525	458	97	287	88	1	473	152	19	238	104	0	361	399	88	105	123	0	316	666	1675	NB	0	0
	PHF	0.83	0.67	0.96	0	0.81	0.85	0.93	0.89	0.37	0.25	0.78	0.88	0.59	0.82	0.81	0	0.82	0.51	0.42	0.94	0.63	0	0.68	0.9	0.81		0%	
	Approach %					31%	27%					28%	9%					22%	24%					19%	40%		EB	9	9
																												100%	
																												9	9

	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Total
400-500	79	194	194	29	184	71	103	333	24	294	359	79	1943
415-515													0
430-530													0
445-545													0
500-600													0

		Southbound (NH 28 Bypass)						Westbound (Tslenneto)						Northbound (NH 28 Byasss)						Eastbound (Tslenneto)								Crosswalk	
Time Period	Class.	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total		Pedestrian	Total
Peak 1	Lights	191	191	79	0	461	692	71	183	29	0	283	460	24	327	102	0	453	299	79	357	294	0	730	476	1927	SB	0	0
Specified Period	%	98%	98%	100%	0%	99%	99%	100%	99%	100%	0%	100%	100%	100%	98%	99%	0%	98%	99%	100%	99%	100%	0%	100%	99%	99%		0%	
4:00 PM - 6:15 PM	Other Vehicles	3	3	0	0	6	6	0	1	0	0	1	2	0	6	1	0	7	3	0	2	0	0	2	5	16	WB	0	0
One Hour Peak	%	2%	2%	0%	0%	1%	1%	0%	1%	0%	0%	0%	0%	0%	2%	1%	0%	2%	1%	0%	1%	0%	0%	0%	1%	1%		0%	
5:00 PM - 6:00 PM	Total	194	194	79	0	467	698	71	184	29	0	284	462	24	333	103	0	460	302	79	359	294	0	732	481	1943	NB	0	0
	PHF	0.88	0.97	0.86	0	0.95	0.95	0.93	0.88	0.66	0	0.93	0.9	0.67	0.95	0.89	0	0.99	0.89	0.76	0.86	0.92	0	0.89	0.88	0.98		0%	
	Approach %					24%	36%					15%	24%					24%	16%					38%	25%		EB	0	0
																												0%	
																												0	0

Project: Exit 4a SDEIS

Loc **19** Location: **NH 102 -Tsienneto Rd**

Growth rates:

Annual	2014->2015	**1.025**
	2016->2015	**0.975**

Seasonal:

Intersection Turning Movement Counts

	AM Peak	PM Peak
May-16 Adj Factor=	**0.96**	**0.98**

		2016- Raw		2016 - AADT				2015 - AADT				2015 - AADT- Rounded				
		AM Peak (700-800)	PM Peak (415-515)	AM Peak (730-830)	Approach Totals	PM Peak (500-600)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals	AM Peak (745-845)	Approach Totals	PM Peak (445-545)	Approach Totals	
EB	LT	14	17	13	182	17	387	13	178	17	378	15	180	15	375	EB
	Thru	176	378	169		370		165		361		165		360		
	RT	0	0	0		0		0		0		0		0		
WB	LT	0	0	0	634	0	435	0	618	0	424	0	620	0	425	WB
	Thru	340	247	326		242		318		236		320		235		
	RT	321	197	308		193		300		188		300		190		
NB	LT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NB
	Thru	0	0	0		0		0		0		0		0		
	RT	0	0	0		0		0		0		0		0		
SB	LT	102	283	98	98	277	284	96	96	270	277	95	95	270	275	SB
	Thru	0	7	0		7		0		7		0		5		
	RT	0	0	0		0		0		0		0		0		
	total	953	1129	914	914	1106	1106	892	892	1079	1079	895	895	1075	1075	

Use Seasonal Factor — Use Annual Factor — Use these in Synchro Existing Cond analyses

	SB		WB		EB		
	LT	RT	TH	RT	LT	TH	Total
700-800	**102**	**0**	**340**	**321**	**14**	**176**	**953**
715-815							0
730-830							0
745-845							0
800-900							0

Time Period	Class.	Southbound (NH 102) R	T	U	I	O	Northbound (NH 102) T	L	U	I	O	Eastbound (Tsienneto Rd.) R	L	U	I	O	Total
Peak 1	Lights	318	332	0	650	258	158	12	0	170	332	0	100	0	100	330	920
Specified Period	%	99%	98%	0%	98%	93%	90%	86%	0%	89%	98%	0%	98%	0%	98%	99%	97%
7:00 AM - 9:15 AM	Other Vehicles	3	8	0	11	20	18	2	0	20	8	0	2	0	2	5	33
One Hour Peak	%	1%	2%	0%	2%	7%	10%	14%	0%	11%	2%	0%	2%	0%	2%	1%	3%
7:00 AM - 8:00 AM	**Total**	**321**	**340**	**0**	**661**	**278**	**176**	**14**	**0**	**190**	**340**	**0**	**102**	**0**	**102**	**335**	**953**
	PHF	0.79	0.85	0	0.82	0.93	0.92	0.88	0	0.91	0.85	0	0.94	0	0.94	0.81	0.9
	Approach %				59%	29%				20%	36%				11%	35%	

	LT	RT	TH	RT	LT	TH	Total
400-500							0
415-515	**283**	**7**	**247**	**197**	**17**	**378**	**1129**
430-530							0
445-545							0
500-600							0

Time Period	Class.	Southbound (NH 102) R	T	U	I	O	Northbound (NH 102) T	L	U	I	O	Eastbound (Tsienneto Rd.) R	L	U	I	O	Total
Peak 1	Lights	194	237	0	431	650	371	17	0	388	244	7	279	0	286	211	1105
Specified Period	%	98%	95%	0%	97%	98%	98%	100%	0%	98%	96%	100%	99%	0%	99%	99%	98%
4:00 PM - 6:15 PM	Other Vehicles	3	10	0	13	11	7	0	0	7	10	0	4	0	4	3	24
One Hour Peak	%	2%	4%	0%	3%	2%	2%	0%	0%	2%	4%	0%	1%	0%	1%	1%	2%
4:15 PM - 5:15 PM	**Total**	**197**	**247**	**0**	**444**	**661**	**378**	**17**	**0**	**395**	**254**	**7**	**283**	**0**	**290**	**214**	**1129**
	PHF	0.93	0.86	0	0.89	0.93	0.87	0.71	0	0.87	0.86	0.88	0.9	0	0.9	0.91	0.93
	Approach %				39%	59%				35%	23%				25%	19%	

2015 Peak Hour Link Volumes based on TMC

Approach		AM Peak Inbound	AM Peak Outbound	AM Peak Total	PM Peak Inbound	PM Peak Outbound	PM Peak Total	2015 AADT	Adjusted 2015 AM Pk	Adjusted 2015 PM Pk	% AADT in AM Pk	% AADT in PM Pk
North	Tsienneto Rd SB	95	315	410	275	205	480	6209	464	501	6.60%	7.73%
South		0	0	0	0	0	0					
East	NH 102 WB, E. of Ts	620	260	880	425	630	1055	13647			6.60%	7.73%
West	NH 102 EB, W of Ts	180	320	500	375	240	615	7955			6.60%	7.73%
		895	895	1790	1075	1075	2150					

Notes: Adjusted 2015 AADT based on ATR counts for comparison purposes
Calculated 2015 AADT based on AM/PM k factors in red
k factors based on ratio of TMC volumes compared to adjusted 2015 AADT from ATR data

CLD/Fuss & O'Neill Inc.

540 Commercial Street
Manchester, NH 03101

File Name : NShorePM
Site Code : 00777777
Start Date : 5/30/2017
Page No : 1

Groups Printed- CARS - Trucks

Start Time	From North					RT 102 From East					North Shore Rd From South					RT 102 From West					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	4	88	0	0	92	21	0	6	0	27	0	110	14	0	124	243
04:15 PM	0	0	0	0	0	6	84	0	0	90	7	0	4	0	11	0	100	10	0	110	211
04:30 PM	0	0	0	0	0	10	99	2	0	111	17	0	7	0	24	0	93	15	0	108	243
04:45 PM	0	0	0	0	0	5	107	0	0	112	18	0	3	0	21	0	106	16	0	122	255
Total	0	0	0	0	0	25	378	2	0	405	63	0	20	0	83	0	409	55	0	464	952
05:00 PM	0	0	0	0	0	5	113	0	0	118	27	0	1	0	28	0	140	20	0	160	306
05:15 PM	0	0	0	0	0	11	107	0	0	118	16	0	3	0	19	0	145	22	0	167	304
05:30 PM	0	0	0	0	0	12	114	0	0	126	24	0	2	0	26	0	124	24	0	148	300
05:45 PM	0	0	0	0	0	7	103	0	0	110	27	0	2	0	29	0	143	15	0	158	297
Total	0	0	0	0	0	35	437	0	0	472	94	0	8	0	102	0	552	81	0	633	1207
Grand Total	0	0	0	0	0	60	815	2	0	877	157	0	28	0	185	0	961	136	0	1097	2159
Apprch %	0	0	0	0		6.8	92.9	0.2	0		84.9	0	15.1	0		0	87.6	12.4	0		
Total %	0	0	0	0	0	2.8	37.7	0.1	0	40.6	7.3	0	1.3	0	8.6	0	44.5	6.3	0	50.8	
CARS	0	0	0	0	0	60	815	2	0	877	156	0	28	0	184	0	961	136	0	1097	2158
% CARS	0	0	0	0	0	100	100	100	0	100	99.4	0	100	0	99.5	0	100	100	0	100	100
Trucks	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
% Trucks	0	0	0	0	0	0	0	0	0	0	0.6	0	0	0	0.5	0	0	0	0	0	0

Start Time	From North					RT 102 From East					North Shore Rd From South					RT 102 From West					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	0	0	5	113	0	0	118	27	0	1	0	28	0	140	20	0	160	306
05:15 PM	0	0	0	0	0	11	107	0	0	118	16	0	3	0	19	0	145	22	0	167	304
05:30 PM	0	0	0	0	0	12	114	0	0	126	24	0	2	0	26	0	124	24	0	148	300
05:45 PM	0	0	0	0	0	7	103	0	0	110	27	0	2	0	29	0	143	15	0	158	297
Total Volume	0	0	0	0	0	35	437	0	0	472	94	0	8	0	102	0	552	81	0	633	1207
% App. Total	0	0	0	0		7.4	92.6	0	0		92.2	0	7.8	0		0	87.2	12.8	0		
PHF	.000	.000	.000	.000	.000	.729	.958	.000	.000	.937	.870	.000	.667	.000	.879	.000	.952	.844	.000	.948	.986

CLD/Fuss & O'Neill Inc.

540 Commercial Street
Manchester, NH 03101

File Name : dshore
Site Code : 33333333
Start Date : 5/30/2017
Page No : 1

Groups Printed- Cars - Trucks

Start Time	From North Left	Thru	Right	Peds	App. Total	Rt 102 From East Left	Thru	Right	Peds	App. Total	North Shore RD From South Left	Thru	Right	Peds	App. Total	Rt 102 From West Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	2	142	0	0	144	25	0	4	0	29	0	73	5	0	78	251
07:15 AM	0	0	0	0	0	3	133	0	0	136	16	0	3	0	19	0	68	3	0	71	226
07:30 AM	0	0	0	0	0	4	155	0	0	159	22	0	4	0	26	0	52	7	0	59	244
07:45 AM	0	0	0	0	0	1	161	0	0	162	18	0	5	0	23	0	65	2	0	67	252
Total	0	0	0	0	0	10	591	0	0	601	81	0	16	0	97	0	258	17	0	275	973
08:00 AM	0	0	0	0	0	2	138	0	0	140	20	0	3	0	23	0	53	1	0	54	217
08:15 AM	0	0	0	0	0	3	158	0	0	161	17	0	2	0	19	0	64	4	0	68	248
08:30 AM	0	0	0	0	0	2	131	0	0	133	15	0	1	0	16	0	23	1	0	24	173
08:45 AM	0	0	0	0	0	1	95	0	0	96	12	0	3	0	15	0	39	1	0	40	151
Total	0	0	0	0	0	8	522	0	0	530	64	0	9	0	73	0	179	7	0	186	789
Grand Total	0	0	0	0	0	18	1113	0	0	1131	145	0	25	0	170	0	437	24	0	461	1762
Apprch %	0	0	0	0		1.6	98.4	0	0		85.3	0	14.7	0		0	94.8	5.2	0		
Total %	0	0	0	0	0	1	63.2	0	0	64.2	8.2	0	1.4	0	9.6	0	24.8	1.4	0	26.2	
Cars	0	0	0	0	0	18	1109	0	0	1127	145	0	25	0	170	0	431	24	0	455	1752
% Cars	0	0	0	0	0	100	99.6	0	0	99.6	100	0	100	0	100	0	98.6	100	0	98.7	99.4
Trucks	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	6	0	0	6	10
% Trucks	0	0	0	0	0	0	0.4	0	0	0.4	0	0	0	0	0	0	1.4	0	0	1.3	0.6

Start Time	From North Left	Thru	Right	Peds	App. Total	Rt 102 From East Left	Thru	Right	Peds	App. Total	North Shore RD From South Left	Thru	Right	Peds	App. Total	Rt 102 From West Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	2	142	0	0	144	25	0	4	0	29	0	73	5	0	78	251
07:15 AM	0	0	0	0	0	3	133	0	0	136	16	0	3	0	19	0	68	3	0	71	226
07:30 AM	0	0	0	0	0	4	155	0	0	159	22	0	4	0	26	0	52	7	0	59	244
07:45 AM	0	0	0	0	0	1	161	0	0	162	18	0	5	0	23	0	65	2	0	67	252
Total Volume	0	0	0	0	0	10	591	0	0	601	81	0	16	0	97	0	258	17	0	275	973
% App. Total	0	0	0	0		1.7	98.3	0	0		83.5	0	16.5	0		0	93.8	6.2	0		
PHF	.000	.000	.000	.000	.000	.625	.918	.000	.000	.927	.810	.000	.800	.000	.836	.000	.884	.607	.000	.881	.965

CLD/Fuss & O'Neill Inc.

540 Commercial Street
Manchester, NH 03101

File Name : englisham
Site Code : 00666666
Start Date : 5/31/2017
Page No : 1

Groups Printed- Cars - Trucks

Start Time	English Range RD From North					Rt 102 From East					From South					Rt 102 From West					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	4	0	23	0	27	0	121	8	0	129	0	0	0	0	0	10	67	0	0	77	233
07:15 AM	2	0	17	0	19	0	140	4	0	144	0	0	0	0	0	20	49	0	0	69	232
07:30 AM	3	0	16	0	19	0	137	1	0	138	0	0	0	0	0	13	56	1	0	70	227
07:45 AM	1	0	19	0	20	0	152	3	0	155	0	0	0	0	0	11	49	0	0	60	235
Total	10	0	75	0	85	0	550	16	0	566	0	0	0	0	0	54	221	1	0	276	927
08:00 AM	3	0	17	0	20	0	92	3	0	95	0	0	0	0	0	9	48	0	0	57	172
08:15 AM	2	0	14	0	16	0	111	1	0	112	0	0	0	0	0	7	45	0	0	52	180
08:30 AM	2	0	7	0	9	0	107	2	0	109	0	0	0	0	0	11	38	0	0	49	167
08:45 AM	1	0	5	0	6	0	76	1	0	77	0	0	0	0	0	6	32	0	0	38	121
Total	8	0	43	0	51	0	386	7	0	393	0	0	0	0	0	33	163	0	0	196	640
Grand Total	18	0	118	0	136	0	936	23	0	959	0	0	0	0	0	87	384	1	0	472	1567
Apprch %	13.2	0	86.8	0		0	97.6	2.4	0		0	0	0	0		18.4	81.4	0.2	0		
Total %	1.1	0	7.5	0	8.7	0	59.7	1.5	0	61.2	0	0	0	0	0	5.6	24.5	0.1	0	30.1	
Cars	17	0	118	0	135	0	922	23	0	945	0	0	0	0	0	85	376	1	0	462	1542
% Cars	94.4	0	100	0	99.3	0	98.5	100	0	98.5	0	0	0	0	0	97.7	97.9	100	0	97.9	98.4
Trucks	1	0	0	0	1	0	14	0	0	14	0	0	0	0	0	2	8	0	0	10	25
% Trucks	5.6	0	0	0	0.7	0	1.5	0	0	1.5	0	0	0	0	0	2.3	2.1	0	0	2.1	1.6

Start Time	English Range RD From North					Rt 102 From East					From South					Rt 102 From West					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	4	0	23	0	27	0	121	8	0	129	0	0	0	0	0	10	67	0	0	77	233
07:15 AM	2	0	17	0	19	0	140	4	0	144	0	0	0	0	0	20	49	0	0	69	232
07:30 AM	3	0	16	0	19	0	137	1	0	138	0	0	0	0	0	13	56	1	0	70	227
07:45 AM	1	0	19	0	20	0	152	3	0	155	0	0	0	0	0	11	49	0	0	60	235
Total Volume	10	0	75	0	85	0	550	16	0	566	0	0	0	0	0	54	221	1	0	276	927
% App. Total	11.8	0	88.2	0		0	97.2	2.8	0		0	0	0	0		19.6	80.1	0.4	0		
PHF	.625	.000	.815	.000	.787	.000	.905	.500	.000	.913	.000	.000	.000	.000	.000	.675	.825	.250	.000	.896	.986

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540 Commercial Street
Manchester, NH 03101

File Name : EnglishPM
Site Code : 00888877
Start Date : 6/5/2017
Page No : 1

Groups Printed- Cars - Trucks

Start Time	English range RD. From North					Rt 102 From East					From South					Rt 102 From West					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
04:00 PM	1	0	5	0	6	1	87	4	0	92	0	0	0	0	0	17	129	0	0	146	244
04:15 PM	4	0	12	0	16	0	82	1	1	84	0	0	0	0	0	8	115	0	0	123	223
04:30 PM	4	0	11	0	15	0	91	3	0	94	0	0	0	0	0	14	150	0	0	164	273
04:45 PM	3	0	10	0	13	0	129	1	0	130	0	0	0	0	0	9	130	0	0	139	282
Total	12	0	38	0	50	1	389	9	1	400	0	0	0	0	0	48	524	0	0	572	1022
05:00 PM	7	0	14	0	21	0	84	2	0	86	0	0	0	0	0	12	136	0	0	148	255
05:15 PM	4	0	8	0	12	0	81	5	0	86	0	0	0	0	0	5	123	0	0	128	226
05:30 PM	0	0	0	0	0	0	115	3	0	118	0	0	0	0	0	2	115	0	0	117	235
05:45 PM	3	0	3	0	6	0	103	1	0	104	0	0	0	0	0	3	119	0	0	122	232
Total	14	0	25	0	39	0	383	11	0	394	0	0	0	0	0	22	493	0	0	515	948
Grand Total	26	0	63	0	89	1	772	20	1	794	0	0	0	0	0	70	1017	0	0	1087	1970
Apprch %	29.2	0	70.8	0		0.1	97.2	2.5	0.1		0	0	0	0		6.4	93.6	0	0		
Total %	1.3	0	3.2	0	4.5	0.1	39.2	1	0.1	40.3	0	0	0	0	0	3.6	51.6	0	0	55.2	
Cars	26	0	63	0	89	0	764	20	1	785	0	0	0	0	0	69	1015	0	0	1084	1958
% Cars	100	0	100	0	100	0	99	100	100	98.9	0	0	0	0	0	98.6	99.8	0	0	99.7	99.4
Trucks	0	0	0	0	0	1	8	0	0	9	0	0	0	0	0	1	2	0	0	3	12
% Trucks	0	0	0	0	0	100	1	0	0	1.1	0	0	0	0	0	1.4	0.2	0	0	0.3	0.6

Start Time	English range RD. From North					Rt 102 From East					From South					Rt 102 From West					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	4	0	11	0	15	0	91	3	0	94	0	0	0	0	0	14	150	0	0	164	273
04:45 PM	3	0	10	0	13	0	129	1	0	130	0	0	0	0	0	9	130	0	0	139	282
05:00 PM	7	0	14	0	21	0	84	2	0	86	0	0	0	0	0	12	136	0	0	148	255
05:15 PM	4	0	8	0	12	0	81	5	0	86	0	0	0	0	0	5	123	0	0	128	226
Total Volume	18	0	43	0	61	0	385	11	0	396	0	0	0	0	0	40	539	0	0	579	1036
% App. Total	29.5	0	70.5	0		0	97.2	2.8	0		0	0	0	0		6.9	93.1	0	0		
PHF	.643	.000	.768	.000	.726	.000	.746	.550	.000	.762	.000	.000	.000	.000	.000	.714	.898	.000	.000	.883	.918

APPENDIX B: SEASONAL, ANNUAL AND AXLE CORRECTION FACTORS

Year 2015 Monthly Data

Peak Hour Data
Group 4 Averages Urban Highways

	Data				Factors			
Month	AM	Mid	PM	Sat Mid	AM	Mid	PM	Sat Mid
Jan	17267	13564	20154	15524	1.11	1.14	1.11	1.17
Feb	17366	13436	20253	17441	1.10	1.16	1.11	1.05
Mar	19827	14389	22267	16671	0.97	1.08	1.01	1.09
Apr	19924	15214	22733	18484	**0.96**	1.02	**0.99**	0.99
May	20046	16198	23476	18916	**0.96**	0.96	**0.96**	0.96
Jun	19952	16451	23779	19485	0.96	0.94	0.94	0.94
Jul	18444	17126	23314	18349	1.04	0.91	0.96	0.99
Aug	18720	16672	23360	19436	1.02	0.93	0.96	0.94
Sep	20260	16000	23092	19374	0.95	0.97	0.97	0.94
Oct	20391	15823	23465	18951	0.94	0.98	0.96	0.96
Nov	19208	15635	21905	17902	1.00	0.99	1.02	1.02
Dec	18348	15787	21589	18339	1.04	0.98	1.04	0.99
Average	19146	15525	22449	18239				

Factors are based on Average Month.

tblSeasonalFactors

NHDOT Seasonal Adjustment Factors by Roadway Group - 2015

		Group1	Group2	**Group3**	**Group4**	Group5	Group6
StartDate	FinDate	Rural Interstate	Rural Highways	Urban Interstate	Urban Highways	Recreational Highways	Other Recr Highways
1/1/2015	1/2/2015	1.18	1.35	1.24	1.32	1.21	1.35
1/1/2015	1/9/2015	1.35	1.16	1.10	1.02	1.31	1.83
1/12/2015	1/16/2015	1.23	1.12	1.05	1.00	1.21	1.82
1/19/2015	1/23/2015	1.15	1.07	1.02	0.99	1.19	1.59
1/26/2015	1/30/2015	1.67	1.34	1.39	1.27	1.59	2.24
2/2/2015	2/6/2015	1.43	1.20	1.21	1.13	1.40	2.18
2/9/2015	2/13/2015	1.37	1.18	1.17	1.09	1.33	2.10
2/16/2015	2/20/2015	1.11	1.09	1.01	1.01	1.15	1.42
2/23/2015	2/27/2015	1.17	1.10	1.04	1.02	1.17	1.50
3/2/2015	3/6/2015	1.20	1.10	1.04	0.99	1.21	1.50
3/9/2015	3/13/2015	1.14	1.06	0.99	0.96	1.15	1.45
3/16/2015	3/20/2015	1.17	1.09	1.02	0.99	1.20	1.45
3/23/2015	3/27/2015	1.20	1.07	1.02	0.96	1.22	1.55
3/30/2015	4/3/2015	1.15	1.04	0.99	0.94	1.19	1.49
4/6/2015	4/10/2015	1.21	1.07	1.01	0.96	1.25	1.67
4/13/2015	4/17/2015	1.18	1.02	0.99	0.92	1.16	1.52
4/20/2015	4/24/2015	1.11	1.03	0.97	0.93	1.13	1.53
4/27/2015	5/1/2015	1.18	1.01	1.00	0.95	1.15	1.57
5/4/2015	5/8/2015	1.10	0.93	**0.95**	**0.88**	1.02	1.32
5/11/2015	5/15/2015	1.07	0.93	0.94	0.89	1.01	1.36
5/18/2015	5/22/2015	0.98	0.91	0.91	0.88	0.93	1.23
5/25/2015	5/29/2015	0.98	0.93	**0.96**	0.93	0.93	1.08
6/1/2015	6/5/2015	1.07	0.94	0.94	0.89	0.98	1.29
6/8/2015	6/12/2015	1.00	0.90	0.92	0.87	0.92	1.08
6/15/2015	6/19/2015	0.92	0.87	0.89	0.87	0.75	0.85
6/22/2015	6/26/2015	0.90	0.88	0.88	0.88	0.86	0.83
6/29/2015	7/3/2015	0.83	0.86	0.89	0.90	0.77	0.73
7/6/2015	7/10/2015	0.83	0.85	0.87	0.89	0.74	0.73
7/13/2015	7/17/2015	0.83	0.85	0.86	0.88	0.77	0.73
7/20/2015	7/24/2015	0.80	0.84	0.85	0.87	0.73	0.68
7/27/2015	7/31/2015	0.80	0.83	0.85	0.88	0.75	0.66
8/3/2015	8/7/2015	0.78	0.83	0.84	0.88	0.73	0.64
8/10/2015	8/14/2015	0.78	0.86	0.84	0.89	0.75	0.65
8/17/2015	8/21/2015	0.80	0.85	0.85	0.89	0.76	0.67
8/24/2015	8/28/2015	0.85	0.88	0.88	0.89	0.82	0.79
8/31/2015	9/4/2015	0.88	0.87	0.90	0.88	0.86	0.90
9/7/2015	9/11/2015	0.88	0.89	0.92	0.94	0.87	0.92
9/14/2015	9/18/2015	0.96	0.91	0.91	0.90	0.92	0.94
9/21/2015	9/25/2015	0.97	0.91	0.91	0.89	0.94	1.05
9/28/2015	10/2/2015	1.02	0.93	0.93	0.91	0.98	1.08
10/5/2015	10/9/2015	0.92	0.89	0.90	0.90	0.85	0.91
10/12/2015	10/16/2015	0.88	0.89	0.89	0.90	0.87	0.92
10/19/2015	10/23/2015	1.06	0.95	0.94	0.92	1.04	1.29
10/26/2015	10/30/2015	1.12	0.98	0.96	0.92	1.11	1.49
11/2/2015	11/6/2015	1.13	0.97	0.96	0.92	1.11	1.49
11/9/2015	11/13/2015	1.15	1.01	0.98	0.94	1.16	1.68
11/16/2015	11/20/2015	1.16	1.01	0.96	0.93	1.16	1.71
11/23/2015	11/27/2015	1.03	1.05	1.01	1.06	1.15	1.46
11/30/2015	12/4/2015	1.20	1.03	0.97	0.94	1.21	1.79
12/7/2015	12/11/2015	1.18	1.03	0.96	0.93	1.19	1.69
12/14/2015	12/18/2015	1.13	0.99	0.94	0.92	1.17	1.69
12/21/2015	12/25/2015	1.17	1.12	1.05	1.05	1.26	1.56
1/1/2016	1/1/2016	1.10	1.19	1.09	1.14	1.22	1.23

NHDOT Axle Correction Factors
by Functional Classification - 2015

	AcfYear	FC	Description	Factor
Rural	2015	01		0.908
	2015	02		0.962
	2015	06		0.967
	2015	07		0.959
	2015	08		0.993
	2015	09		0.997
Urban	2015	11	Interstate	0.953
	2015	12	Freeways/ Expressways	0.956
	2015	14	Principle Arterials	0.973
	2015	16	Minor Arterials	0.981
	2015	17	Collectors	0.989
	2015	19	Local Streets	0.987
	2015	00		1.000

APPENDIX C: INTERSTATE COUNTS AND BALANCING CALCULATIONS AT RAMP TERMINALS

I-93 Interstate Balancing based on ATR and TMC counts - 2015 and 2016

Last revision Date: **7/29/2016**

	Using May 2015 counts	AWDT =	7-8 AM	% AWDT	5-6 PM	% AWDT
Total	AVG Weekday	76490	5533	7.23%	5997	7.84%
NB	AVG Weekday	38078	2021	5.31%	3483	9.15%
SB	AVG Weekday	38412	3512	9.14%	2515	6.55%

Seasonal Adjustment factor to 2015 AADT= **0.98**

	Using May 2016 counts	7-8 AM	5-6 PM
Total	AVG Weekday	5567	6113
NB	AVG Weekday	2246	3601
SB	AVG Weekday	3321	2512

Ann/Seasonal Adjustment factor to 2015 AADT= **0.9702**

0.99 2016->2015
0.98 May->AADT

2015 adj AAWDT - I-93 South of Exit 4 at Windham TL

	7-8 AM	5-6 PM
Total	5420	5880
NB	1980	3410
SB	3440	2460

2015 AAWDT - I-93 South of Exit 4 at Windham TL

	7-8 AM	5-6 PM
Total	5400	5930
NB	2180	3490
SB	3220	2440

Ramp counts			May-16 AWDT	7-8 AM	% AWDT	5-6 PM	% AWDT	2015 AWDT (adj) 7-8 AM	5-6 PM
May-16	Exit 4	NB Off	11321	422	3.73%	1223	10.80%	409	1187
		NB on	11380	1091	9.59%	812	7.14%	1058	788
		SB off	10893	776	7.12%	952	8.74%	753	924
		SB on E-S	5865	687	11.71%	311	5.30%	667	302
		SB on W-S	5265	534	10.14%	244	4.63%	518	237
	Exit 5	NB Off	6251	422	6.75%	472	7.55%	409	458
		NB on	10661	1008	9.46%	793	7.44%	978	769
		SB off	10574	781	7.39%	939	8.88%	758	911
		SB on	6233	532	8.54%	427	6.85%	516	414

SB off vol fr/7-8 on 5/24 appears inconsistent - use AWDT for that hour

NOTE: Peak Hr Vol either day of TMC or AWDT from May count

2015 AWDT - Mainline I-93
AM Peak

	START I93 S of E4	SUBTRACT E4 NB off	ADD E4 NB on		I93 NB N of E4	SUBTRACT E5 NB off	ADD E5 NB on	I93 NB N of E5	
NB	1980	409	1058		2629	409	978	3198	
	1980	410	1060		2630	410	980	3200	rounded
	START I93 S of E4	**SUBTRACT E4 SB on E-S**	**SUBTRACT E4 SB on W-S**	**ADD E4 SB off**	**I93 SB N of E4**	**SUBTRACT E5 SB on**	**ADD E5 SB off**	**I93 SB N of E5**	
SB	3440	667	518	753	3008	516	758	3250	
	3440	665	520	755	3010	515	760	3255	rounded

2015 AWDT - Mainline I-93
PM Peak

	START I93 S of E4	SUBTRACT E4 NB off	ADD E4 NB on		I93 NB N of E4	SUBTRACT E5 NB off	ADD E5 NB on	I93 NB N of E5	
NB	3410	1187	788		3011	458	769	3322	
	3410	1185	790		3015	460	770	3325	rounded
	START I93 S of E4	**SUBTRACT E4 SB on E-S**	**SUBTRACT E4 SB on W-**	**ADD E4 SB off**	**I93 SB N of E4**	**SUBTRACT E5 SB on**	**ADD E5 SB off**	**I93 SB N of E5**	
SB	2460	302	237	924	2845	414	911	3342	
	2460	300	215	925	2870	415	910	3365	rounded

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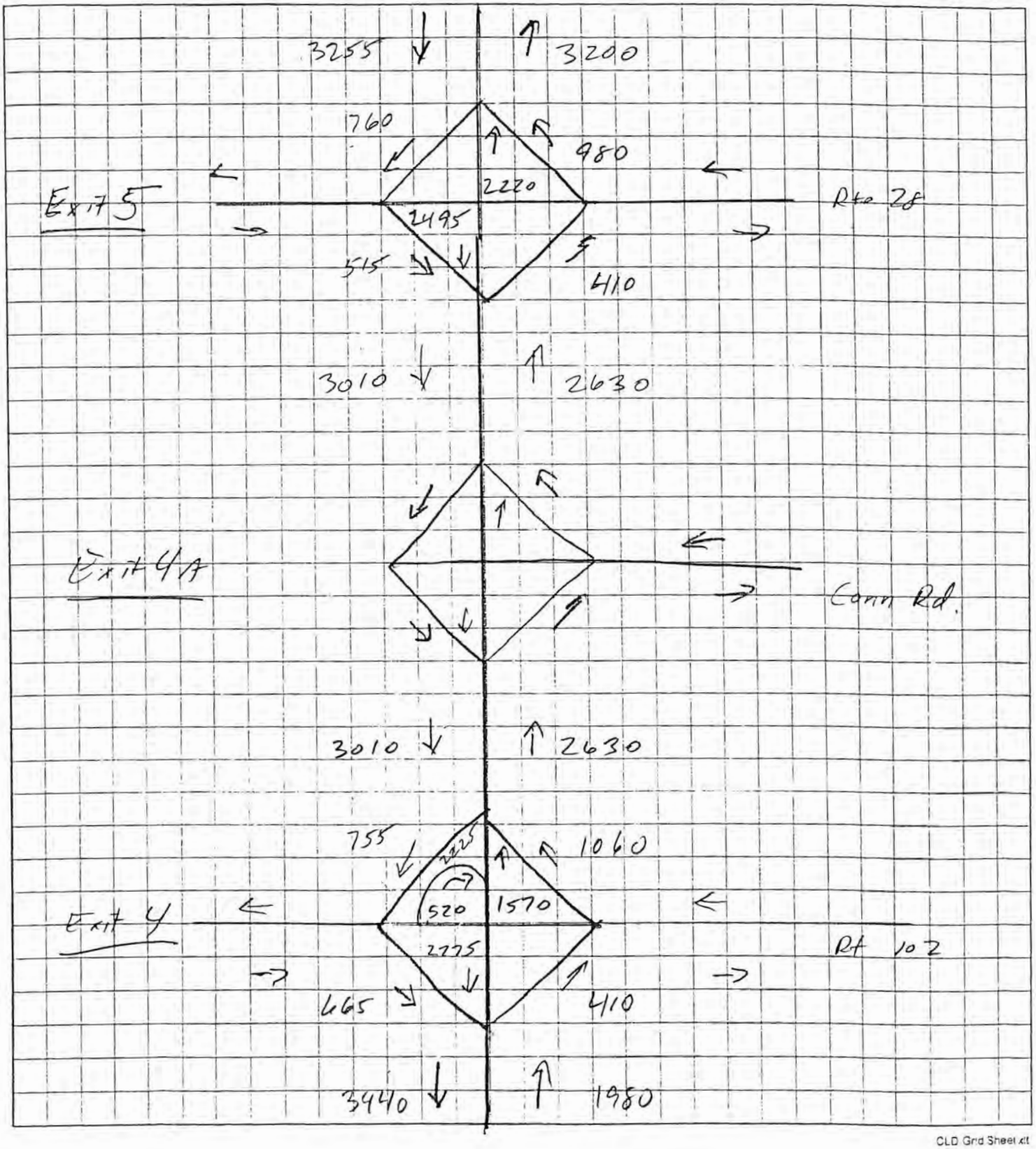
JOB Exit 4A SDEIS JOB NO 05-0244

SHEET NO _____ OF _____

CALCULATED BY PK DATE 7-27-16

CHECKED BY CCG DATE 8/7/16

SUBJECT 2015 AM Peak - Exist. w/ ATRs SCALE AWDT



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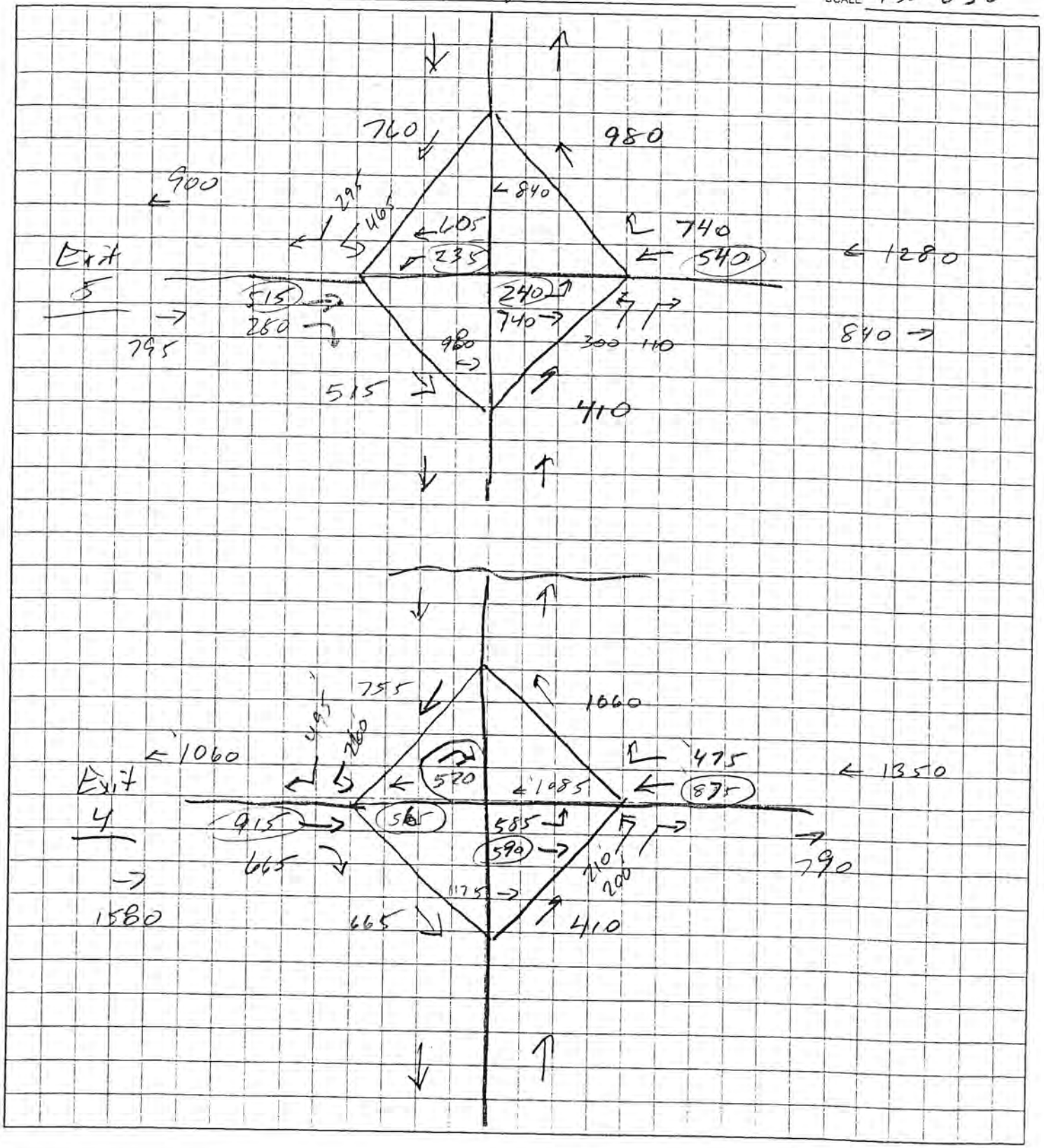
JOB Exit 4A JOB NO
SHEET NO OF
CALCULATED BY PK DATE 7-27-16
CHECKED BY LCG DATE 8/7/16
SUBJECT 2015 AM Peak - Balanced SCALE 730-830



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JOB Exit 4A traffic JOB NO. 05-244
SHEET NO OF
CALCULATED BY PK DATE 7-27-16
CHECKED BY LCG DATE 8/7/16
7:30-8:30 SUBJECT Balanced Exit 4 volumes SCALE AM PK

1) Start @ NB off ramp int. – NB off = 410
NB on = 1060

NB off Lt = 219 → 210
fr/TMC RT = 210 → 200
429 → 410 (x .9557)

NB on LT on = 562 → 585
fr/TMC RT on = 455 → 475
1017 → 1060 (x 1.0423)

2) SB off/on ramps SB on (W-S) = 520 ✓
SB on (E-S) = 665 ✓
SB off = 755

SB off Lt = 267 260
fr/TMC RT = 503 495
770 → 755 (x 0.9805)

3) EB traffic – Start @ NB ramps – Proportional growth

Lt 562 → 585 (x 1.0409)
EB Th 548 590
1130 1175 – 760 (LT fr/SB off) = 415 EB Th @ SB ramps.

4) WB traffic – Start @ NB ramp

WB Th 836 875 + 210 (LT off) = 1085 – 520 (RT on)
WB RT 455 → 475 565 WB Th @ SB ramp
1291 1350
(x 1.0437)

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JOB Exit 4a JOB NO 05-249
SHEET NO OF
CALCULATED BY DK DATE 7-27-16
CHECKED BY LCG DATE 8/2/16
SUBJECT Balanced Exit 5 volumes - AM SCALE 730-830 TMC

1) Balance exit volumes between ramps + counts are close -

NB - 959 dep @ SB, 951 arr @ NB 959/951 = 1.008

fr/TMC	EB LT =	216	218	(220)	check
o NB	EB Th =	735	741	740	
ramp		951	→ 959	→ 960	rounded

WB - 842 dep fr/NB, 830 arr @ SB 842/830 = 1.0145

fr/TMC @ SB ramp	WB LT =	192	195	195	
	WB Th =	638	647	645	
		830	→ 842	→ 840	rounded

2) NB off ramp fr/TMC

LT off =	273	300	840 - 300 =	540 WB Th.
RT off =	100	110		
	373	→ 410	(1.0992)	

NB on ramp fr TMC

LT on	216 (.24)	(240)		
RT on	672 (.76)	740		
	888	→ 980	(1.1036)	

3) SB off ramp fr/tmc

LT off	496	465		
RT off	319	295		
	815	→ 760	(.9325)	

4) SB on ramp (fr/TMC)

LT on	192	235		
RT on	326	280		
	518	→ 515	(1.232)	

EB Thru (240 + 740) = 980 - 465 = 515 EB Th
LT

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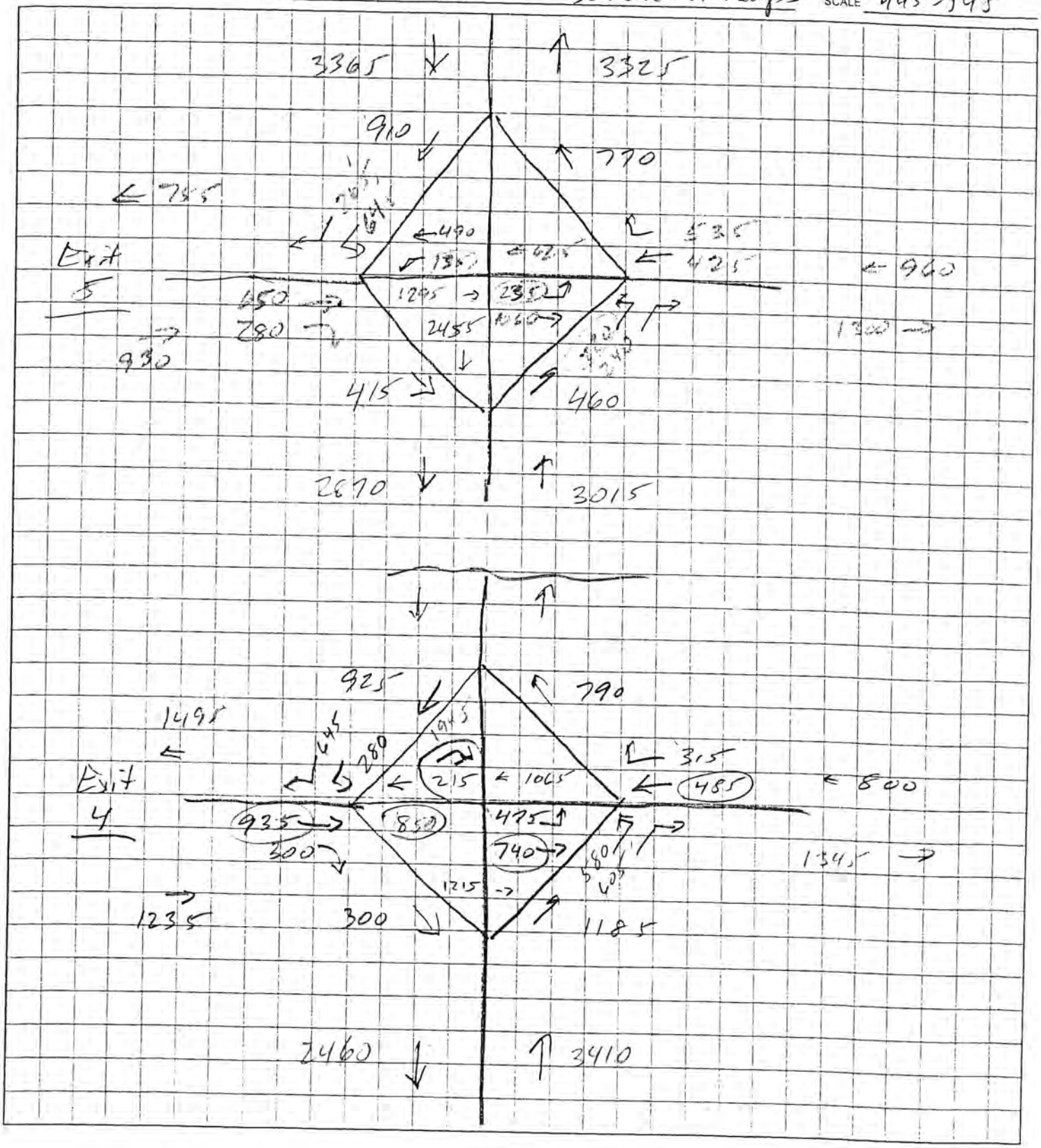
JOB Exit 4A JOB NO 05-244
SHEET NO 1 OF 1
CALCULATED BY PIC DATE 7-27-16
CHECKED BY LCG DATE 8/7/16
SUBJECT 2015 PM Peak - Balanced ramps SCALE 445, 545



CLD Grid Sheet rt

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JOB Exit 4A JOB NO 05-244
SHEET NO OF
CALCULATED BY PK DATE 7-27-16
CHECKED BY LCG DATE 8/2/16
445-545 SUBJECT Balanced Exit 4 volumes SCALE P.M. Plc

1) Start @ NB off ramp - NB off = 1185
NB on = 790

NB off (f/ TMC): LT = 535 (.49) → 580
RT = 558 (.51) → 605
1093 → 1185 (x 1.084)

NB on (f/ TMC): LT on = 536 (.60) → 475
RT on = 353 (.40) → 315
889 → 790 (x .886)

2) SB on/off ramps f/ ATR: SB on (W-S) = 215
SB on (E-S) = 300
SB off = 925

SB off (f/ TMC): LT 306 (.31) → 280
RT 683 (.69) → 645
989 → 925 (x 0.941)

3) EB traffic - Start @ NB ramp - TMC - Plus on local ground 1

LT = 536 → 475 (x 0.886)
EB TH = 835 → (740)
1371 1215 - 280 (SB LT off) = (935)

4) WB traffic - Start @ NB ramp TMC

WB TH = 542 485 + 580 (NB LT) = 1065 - 215 (SB on) = (850) WB thru @ SB ramp
WB RT = 353 → 315 (x 0.8924)
895 800

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JOB Exit 4a JOB NO 05-244

SHEET NO 1 OF 2

CALCULATED BY PK DATE 7-29-16

CHECKED BY LCG DATE 8/7/16

SUBJECT Balanced Exit 5 volumes - PM SCALE 445 345 Thru C

1) Balance with Thru Lane counts + Exit 4 one hour

EB - 1331 veh left SB ramp → 1337 during the AM hour

Left Thru C	LT off	650	652	655
+ SB ramp	Exit Thru	681	684	685
		1331 →	1337 →	1340

(× 1.0045)

WB - 611 veh left NB ramp → 548 during the PM hour

Left Thru C	WB LT	116	119	121
+ SB ramp	NB Thru	482	492	490
		598 →	611 →	611

(× 1.0217)

3) NB off ramp (A/ Thru C)

	LT off	210	215	210
	RT off	235	242	234
		445 →	460	460

(× 1.0334)

NB on ramp (A/ Thru C)

	LT on	230	236	235 → 235 + 1
	RT on	515	534	532
		745 →	770	770

(× 1.0363)

2) SB off ramp (A/ Thru C)

	LT off	640	643	643 → 643 - 54
	RT off	287	287	265
		927 →	930	908

(× 0.9814)

SB on ramp (A/ Thru C)

	LT on	146	135	135 + 15
	RT on	247	282	280
		393 →	415	415

(× 1.0483)

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JOB Exit 4a JOB NO 15.244

SHEET NO 2 OF 2

CALCULATED BY DR DATE 7.29.16

CHECKED BY LCG DATE 8/7/16

SUBJECT Balance EB + WB volumes - PM SCALE

9) Adjust EB + WB flow vols to match 7AM to ramps

EB thru left + RT = 1135 exit. 235

EB RT = 900 (base) - 50 = 1060

1345 1295

EB left by SB ramps 645 (exit RT ramps) (+50) 645

645 EB th 450

1250 (-50) 1295

WB left on SB ramps

Left on 135 (exit)

WB RT 490

625 + 270 (exit off LT) = 895 WB RT @ AVG ramp

APPENDIX D: TRAVEL DEMAND FORECAST MODEL DEVELOPMENT AND CALIBRATION REPORT – SOUTHERN NH PLANNING COMMISSION, JANUARY 2018

Travel Demand Forecast Model Development and Calibration Report for I-93 Exit 4A Supplemental Draft Environmental Impact Statement

DRAFT

Prepared by the Southern NH Planning Commission and CLD/Fuss & O'Neill

January, 2018

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1.INTRODUCTION

The report serves the purpose of documenting the methodology for development and calibration of the travel demand model for the update of I-93 Exit 4A SDEIS. The report includes development and calibration for the 2015 24-hour base year model, and development for 2040 No-Build 24-hour model. This report doesn't include detailed network and land use description for 2040 build scenarios, alternative A, B, C, D, E and F, because this information is included in the traffic and land use reports prepared by CLD|Fuss & O'Neill and Louis Berger.

2. 2015 BASE YEAR MODEL

2.1 Network

The updated 2015 base year regional travel demand model was built based on the 2010 base year SNHPC regional model. The 2010 Travel Demand Forecast Model Development and Calibration Report [1] detailed development and calibration of the 2010 model. The model covers fifteen communities: Auburn, Bedford, Candia, Chester, Deerfield, Derry, Francestown, Goffstown, Hooksett, Londonderry, Manchester, New Boston, Raymond, Weare, and Windham. The change to the functional classification system for roadway system was incorporated into the 2015 base year model due to changes to the urbanized area from the 2010 U.S. Census. In addition, projects completed between 2010 and 2015, the Manchester Airport Access Road, Pettengill Road in Londonderry, NH 28 Manchester Road improvement in Derry, Hooksett Open Road Tolling, I-93 Exit 5 reconstruction, US 3/NH 28 widening in Hooksett, I-93 Exit 3 area reconstruction, were added to the 2015 model.

2.2 Traffic Analysis Zone (TAZ) System

The fifteen communities in the model area were disaggregated into 306 internal TAZs in the 2010 model. To better reflect traffic patterns around the I-93 Exit 4A study area, TAZs 69 in Londonderry, 123, 124, 125 and 133 in Derry were split into additional smaller TAZs indicated in Table 1. Layouts of these TAZs are displayed in Appendix A.

Table 1 TAZ Splits

TAZ 2010	TAZ 2015 for I-93 Exit 4A
69	69A, 69B and 69C
123	123A and 123B
124	124A, 124B, and 124C
125	125A and 125B
133	133A and 133B

2.3 Population and Households

Population estimates from 2015 Population Estimates of New Hampshire Cities and Towns prepared by the New Hampshire Office of Strategic Initiatives (NHOSI) [2] were used for the 2015 base year model. A summary table including 2015 population estimates for communities within the model area from the NHOSI estimates is presented in Appendix D. Dwelling units collected by SNHPC annually that were issued Certification of Occupancy between 2010 and 2015 by communities were used in allocating change in population into TAZs, and calculating number of households in a TAZ.

The formula used for calculating dwelling unit increases between April 2010 (Census day on April 1) and December 31, 2015 is shown below.

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$$\Delta \boldsymbol{D_{TAZ}} = \Delta \boldsymbol{D_{2015TAZ}} + \Delta \boldsymbol{D_{2014TAZ}} + \Delta \boldsymbol{D_{2013TAZ}} + \Delta \boldsymbol{D_{2012TAZ}} + \Delta \boldsymbol{D_{2011TAZ}} + \frac{\boldsymbol{3}}{\boldsymbol{4}} \Delta \boldsymbol{D_{2010TAZ}})$$

Where:

ΔD_{TAZ}=Increase of dwelling units in a TAZ between April 1, 2010 and December 31, 2015

$\Delta D_{2015TAZ}$= Increase of dwelling units in a TAZ in 2015

$\Delta D_{2014TAZ}$= Increase of dwelling units in a TAZ in 2014

$\Delta D_{2013TAZ}$= Increase of dwelling units in a TAZ in 2013

$\Delta D_{2012TAZ}$= Increase of dwelling units in a TAZ in 2012

$\Delta D_{2011TAZ}$= Increase of dwelling units in a TAZ in 2011

$\Delta D_{2010TAZ}$= Increase of dwelling units in a TAZ in 2010

2015 dwelling units were calculated as follows:

$$\boldsymbol{D_{2015TAZ}} = \boldsymbol{D_{2010TAZ}} + \Delta \boldsymbol{D_{TAZ}}$$

The 2015 population in TAZs were calculated by allocating the difference in population between 2010 and 2015 in a community. If the population increased during 2010-2015, the following formula was used.

$$\boldsymbol{P_{2015TAZ}} = \boldsymbol{P_{2010TAZ}} + (\boldsymbol{P_{2015com}} - \boldsymbol{P_{2010com}}) * \frac{\Delta \boldsymbol{D_{TAZ}}}{\Delta \boldsymbol{D_{com}}}$$

Where:

$P_{2015TAZ}$=2015 population in a TAZ

$P_{2010TAZ}$=2010 population in a TAZ

$P_{2015com}$=2015 population in the community (NHOEP estimates) in which the TAZ located

$P_{2010com}$=2010 population in the community (2010 US Census) in which the TAZ located

ΔD_{TAZ}=Increase of dwelling units in a TAZ between April 1, 2010 and December 31, 2015

ΔD_{com}=Increase of dwelling units in the community in which the TAZ located between April 1, 2010 and December 31, 2015

The 2015 population in TAZs were calculated by allocating the difference of population between 2010 and 2015 in a community. If the population decreased during 2010-2015, the following formula was used.

$$\boldsymbol{P_{2015TAZ}} = \boldsymbol{P_{2010TAZ}} + \Delta \boldsymbol{P_{DWTAZ}} + (\boldsymbol{P_{2015com}} - \boldsymbol{P_{2010com}} - \Delta \boldsymbol{P_{DWcom}}) * \frac{\boldsymbol{D_{2015TAZ}}}{\boldsymbol{D_{2015com}}}$$

Where:

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$P_{2015TAZ}$=2015 population in a TAZ

$P_{2010TAZ}$=2010 population in a TAZ

$P_{2015com}$=2015 population in the community (NHOEP estimates) in which the TAZ located

$\Delta P_{DWTAZ} = \frac{P_{2010TAZ}}{HH_{2010TAZ}} * \Delta D_{TAZ}$ – Assume population change in a TAZ due to dwelling units change between 2010 and 2015

$HH_{2010TAZ}$=2010 number of households in a TAZ

$\Delta P_{DWcom} = \sum \Delta P_{TAZ}$ – Assume population change in the community in which the TAZ located due to dwelling units change between 2010 and 2015

$P_{2010com}$=2010 population in the community (2010 US Census) in which the TAZ located

$D_{2015TAZ}$=2015 dwelling units in a TAZ

$D_{2015com}$=2015 dwelling units in the community in which the TAZ located

Number of households in a TAZ was calculated as follows.

$$HH_{2015TAZ} = D_{2015TAZ} * OR_{2010TAZ}$$

Where:

$HH_{2015TAZ}$=2015 number of households in a TAZ

$D_{2015TAZ}$=2015 dwelling units in a TAZ

$OR_{2010TAZ}$=2010 Occupancy rate in a TAZ

2.4 Student Enrollment

School enrollments for 2014-2015 for all elementary, middle and high schools in the region were collected from the New Hampshire Department of Education. College enrollments were collected by contacting colleges in the region.

2.5 Employment

The quarterly employment of 2015 for each community in the region including first, second, third and fourth quarters was downloaded from the New Hampshire Employment Security (NHES) website. A Summary table containing these data is shown in Appendix E.

The average annual employment for communities was calculated by averaging the four quarters of employment. Considering that the 2010 SNHPC employment for model input calculated directly from the employer database is slightly higher than NHES's annual average, the 2015 annual employment was adjusted to reflect the difference between the two data sets. The adjustment was made according to the following equation.

$$E_{2015comadjusted} = E_{2015comNHES} + (E_{2010comSNHPC} - E_{2010comNHES})$$

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Where:

$E_{2015comadjusted}$ =Adjusted 2015 employment in a community

$E_{2015comNHES}$ =2015 employment average in a community based on NHES data

$E_{2010comNHES}$ =2010 employment average in a community based on NHES data

$E_{2010comSNHPC}$ =2015 employment average in a community based on SNHPC employment database

Building permits issued 2011-2015 were used to identify new businesses in a TAZ. Employment in a new building was estimated based on a similar business type in 2010 employment database obtained from NHES. Employment in businesses we were aware closed during 2011-2015 was estimated based on the 2010 employment database.

To allocate the difference between 2010 and 2015 to TAZs by employment category, the following formula was used.

$$E_{2015TAZ-EC} = E_{2010TAZ-EC} + \Delta E_{DWTAZ-EC} + (E_{Ann2015} - E_{Ann2010} - \Delta E_{DW2011-2015}) * (E_{2010TAZ-EC}/E_{Ann2010})$$

Where:

$E_{2015TAZ-EC}$=2015 Employment in a TAZ by employment category group

$E_{2010TAZ-EC}$=2010 Employment in a TAZ by employment category group

$\Delta E_{DWTAZ-EC}$=Assumed Change of Employment in a TAZ by employment category group due to number of building permits change between 2010 and 2015

$E_{Ann2015}$=2015 Annual employment in the community in which TAZ located

$E_{Ann2010}$=2010 Annual employment in the community in which TAZ located

$\Delta E_{DW2011-2015}$ = Change of employment in the community due to number building permits change between 2010 and 2015

2.6. Base Year Model Calibration and Validation

Highway assignment is crucial for models to produce traffic volume estimates within acceptable ranges of tolerance compared to actual ground counts. For detailed model calibration and validation methodology information, refer to 2010 Travel Demand Forecast Model Development and Calibration Report for the Southern New Hampshire Planning Commission [1]. Model calibration and validation results for the 2015 base year are as follows.

- The difference of Vehicle Mile Traveled (VMT) estimates between the model and the Highway Performance Monitoring System (HPMS) is 1.28%, which is acceptable according to the Model Validation and Reasonableness Checking Manual [3], which is allowed a 3% difference by Environmental Protection Agency (EPA).

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- The Coefficient of Determination (R^2) region wide equals 0.91 which is greater than the Model Validation and Reasonableness Checking Manual [3] recommended, which is 0.88 for all roadways with functional class collector and higher. Percent Root Mean Square of the Error (% RMSE) equals 27.28 for all roadways with functional class collector and higher which is less than the commonly accepted standard of 30 [3].
- Absolute percentage differences of total observed versus model estimated volumes at a Merrimack River screen line crossing and external station cordon line crossings are less than 2%.
- Absolute percentage differences of observed versus model estimated volumes at locations within I-93 Exit 4A area shown in Appendix C are within acceptable ranges of tolerance based on FHWA targets [3].

3. FUTURE YEAR 2040 NO-BUILD MODEL

3.1 Network

2040 No-Build model network was built by adding projects documented in Regional Transportation Plan 2017-2040 for the SNHPC Region [6] to the 2015 base year model except I-93 Exit 4A project. The list of the projects is shown in Appendix B.

3.2 Population and Households

Population projections used in the 2040 No-Build model were based on the State of New Hampshire County Population Projections 2015-2040 By Municipality [5] prepared by New Hampshire Office of Strategic Initiatives (NHOSI) in partnership with the state's Regional Planning Commissions and additional adjustments to NHOSI projections were made according to the final numbers in the Land Use Scenarios Report [4] to reflect additional population and households for relevant 2040 No-Build development projects. The population projections from 2015 through 2040 for each community in the region from the NHOSI projections are presented in Appendix D.

Due to the fact that numbers of dwelling units changes in five-year increments was used in distributing population changes to TAZs, and calculating numbers of households in a TAZ, SNHPC dwelling unit projections for 2010 through 2040 (Completed 2012) were adjusted for 2020 through 2040 to reflect number of dwelling units change between 2010 and 2015. An assumption was made that numbers of dwelling unit growth rates 2015-2040 were kept the same as the 2012 Southern NH Planning Commission dwelling unit projection for 2010-2040, which were reviewed by corresponding communities in the region. Two conditions were considered as the population was allocated to TAZs: 1) population increase in a five-year period; 2) Population decrease in a five-year period.

Condition one

When the population increases during a five-year period, the allocation is calculated using the following formula.

$$\Delta \boldsymbol{P_{TAZ}} = \frac{\Delta \boldsymbol{P_{com}}}{\Delta \boldsymbol{D_{com}}} * \Delta \boldsymbol{D_{TAZ}}$$

Where:

ΔP_{TAZ}= population change in a TAZ during a five-year period

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ΔP_{com}=Population change in the community in which the TAZ located during the five-year period

ΔD_{TAZ}=Number of dwelling units change in a TAZ during the five-year period

ΔD_{com}= Number of dwelling units change in the community in which the TAZ located during the five-year period

Condition two

When the population decreases during a five-year period, the allocation is calculated using the following formula.

$$\Delta \boldsymbol{P_{TAZ}} = \Delta \boldsymbol{P_{DWTAZ}} + (\Delta \boldsymbol{P_{com}} - \Delta \boldsymbol{P_{DWcom}}) * \frac{\boldsymbol{D_{TAZ}}}{\boldsymbol{D_{com}}}$$

Where:

ΔP_{TAZ}= Population change in a TAZ during a five-year period

$\Delta P_{DWTAZ} = HHS_{2015TAZ} * \Delta D_{TAZ}$ =Assume population change in a TAZ during a five-year period due to number of dwelling units change

$HHS_{2015TAZ}$= 2015 household size within the TAZ

ΔP_{com}= Change of population in the community in which the TAZ located during the 5-year period

$\Delta P_{dwcom} = \sum \Delta P_{dwTAZ}$= Population change in the community in which the TAZ located during the five-year period due to number of dwelling units change

D_{TAZ}=Number of dwelling units in the TAZ at the end of the five-year period

D_{com}
= Number of dwelling units in the cummunity in which the TAZ located at end of the five − year period

Population within a TAZ at end of a five-year period was calculated as follows.

$$\boldsymbol{P_{TAZ}} = \boldsymbol{P_{TAZ-1}} + \Delta \boldsymbol{P_{TAZ}}$$

Where:

P_{TAZ} =Population in the TAZ at end of the five-year period

P_{TAZ-1} =Population in the TAZ at end of the prior five-year period

Number of Households Calculation

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Numbers of households for TAZs were calculated using the following formula.

$$\boldsymbol{HH_{TAZ} = (P_{TAZ} - P_{specialTAZ})/HHS_{2015}}$$

Where:

HH_{TAZ} = Number of households in a TAZ

$P_{specialTAZ}$ = Special population such population in nursing homes, jails, etc. in the TAZ

$HHS_{2015TAZ}$ = Household size in the TAZ

3.3 Employment

In order to reflect changes in employment between 2010 and 2015, the original SNHPC employment projection for 2010 through 2040 (completed in 2012) was adjusted for 2020 through 2040. Three steps are followed in calculating the 2015-2040 employment projection. Additional adjustments were made to the final numbers based on the Land Use Scenarios Report [4] to account for additional employment for relevant 2040 No-Build development projects.

Step 1: Growth rates

The study assumes that employment growth rates by employment category group for 2015-2040 were kept the same as the 2012 Southern NH Planning Commission employment projection for 2010-2040, which were reviewed by corresponding communities in the region. The following formula was used in calculating growth rates over a five-year interval.

$$GR_{Com\ EC\ i} = (E_{2012\ Com\ EC\ i} - E_{2012\ Com\ EC\ i-1})/E_{2012\ Com\ EC\ i-1}$$

Where:

i = projection years 2015, 2020, 2025, 2030, 2035 and 2040

$GR_{Com\ EC\ i}$ = Growth rate by employment category group over i to i-1 five-year interval

$E_{2012\ com\ EC\ i}$ = Total employment for an employment category group in a community at projection year i in 2012 projection

$E_{2012\ com\ EC\ i-1}$ = Total employment for the employment category group in community at projection year i-1 in 2012 projection

Step 2: Total employment projection for an employment category group in a community 2020 through 2040

The 2015 total employment estimate for an employment category group in a community was considered as base. Total employment projections for the employment category group in the community 2020 through 2040 were calculated as follows:

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$$E_{2016\ Com\ EC\ i} = E_{2016\ Com\ EC\ i-1} * (1 + GR_{Com\ EC\ i})$$

Where:

i = projection years 2020,2025,2030,2035 and 2040

$E_{2016\ com\ EC\ i}$ = Total employment for an employment category group in the community at projection year i in the 2016 projection

$E_{2016\ com\ EC\ i-1}$ = Total employment for the employment category group in the community at projection year i-1 in the 2016 projection

Step 3: Total employment for an employment category group in the community for 2020-2040 projection distributed to TAZs

Two conditions were used as total projected employment for an employment category group in the community was allocated into TAZs.

Condition one

When the data for developable land for a land use category is available and appropriate to use in a community, employment is distributed based on percentage of developable land in a TAZ in total of developable land in the community.

$$E_{2016\ TAZ\ EC\ i} = E_{2016\ TAZ\ EC\ i-1} + (E_{2016\ Com\ EC\ i} - E_{2016\ Com\ EC\ i-1}) * Percentage$$

Where:

$E_{2016\ TAZ\ EC\ i}$ = 2016 Employment projection in a TAZ for an employment category group at projection year i

$E_{2016\ TAZ\ EC\ i-1}$ = 2016 Employment projection in a TAZ for the employment category group at projection year i-1 in the 2016 projection

$E_{2016\ com\ EC\ i}$ = Total employment for the employment category group in the community at projection year i in the 2016 projection

$E_{2016\ com\ EC\ i-1}$ = Total employment for the employment category group in the community at projection year i-1 in the 2016 projection

Condition two

When the data for developable land for the land use category is not available or not appropriate to use in a community, employment in a TAZ is calculated using the same growth rate as that of employment of the employment category.

$$E_{2016\ TAZ\ EC\ i} = E_{2016\ TAZ\ EC\ i-1} * (1 + GR_{2016\ Com\ EC\ i})$$

Where:

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$E_{2016\,TAZ\,EC\,i}$ = 2016 Employment projection in a TAZ for an employment category group at projection year i

$E_{2016\,TAZ\,EC\,i-1}$ = 2016 Employment projection in a TAZ for the employment category group at projection year i-1 in the 2016 projection

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4. REFERENCES

1. 2010 Travel Demand Forecast Model Development and Calibration Report, Southern New Hampshire Planning Commission, 2012.
2. 2015 Population Estimates of New Hampshire Cities and Towns, The New Hampshire Office of Strategic Initiatives (NHOSI), 2016.
3. Model Validation and Reasonableness Checking Manual, Travel Model Improvement Program, 2001.
4. I-93 Exit 4A Supplemental Draft Environmental Impact Statement Land Use Scenarios Report, Louis Berger, 2017.
5. State of New Hampshire County Population Projections, By Municipality, The New Hampshire Office of Strategic Initiatives (NHOSI) in Partnership with the State's Regional Planning Commissions , 2016
6. FY 2017 – FY 2040 Regional Transportation Plan for the Southern NH Planning Commission, Southern New Hampshire Planning Commission, 2017.

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APPENDIX A STUDY AREA TAZ SPLIT

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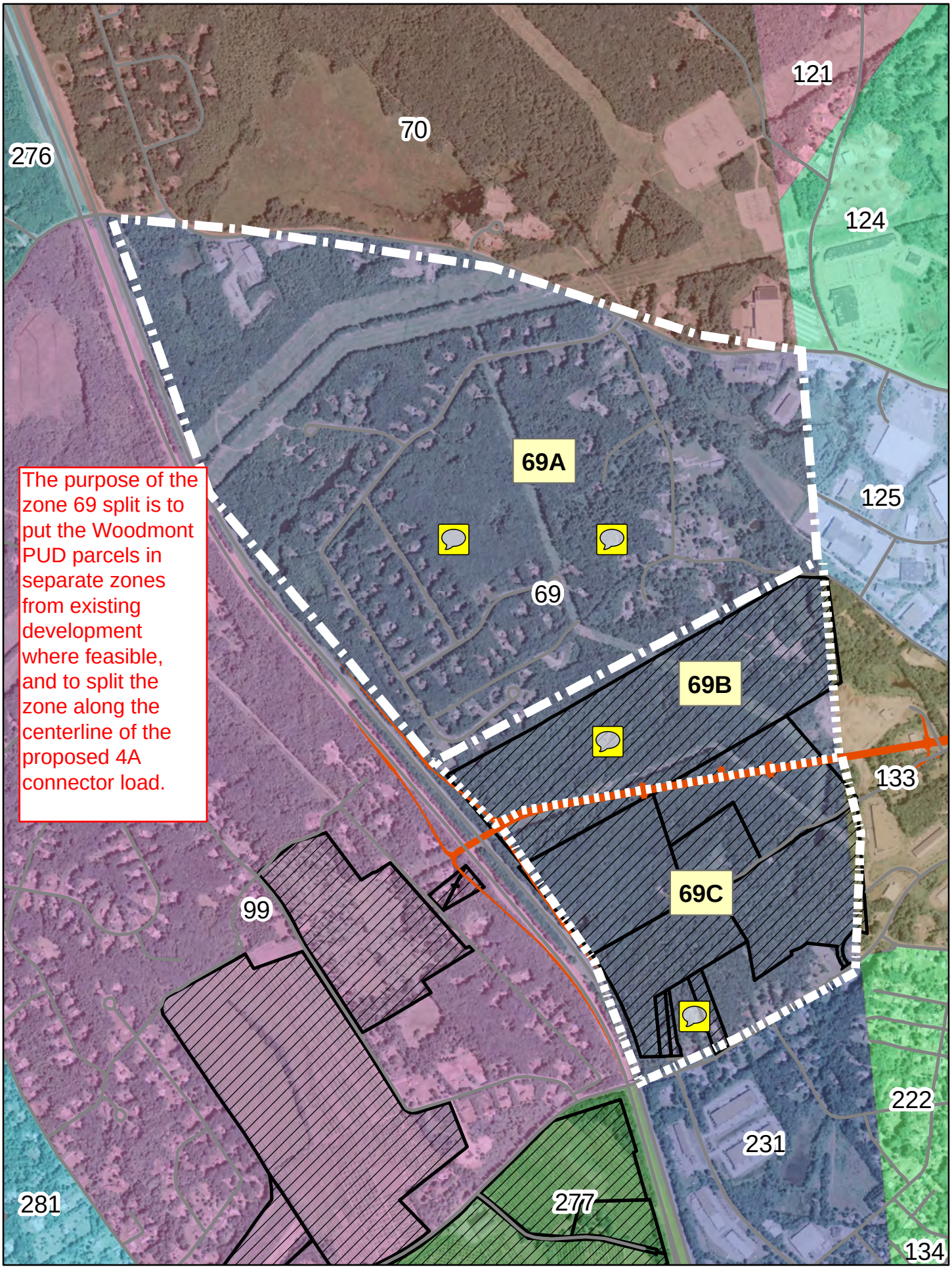
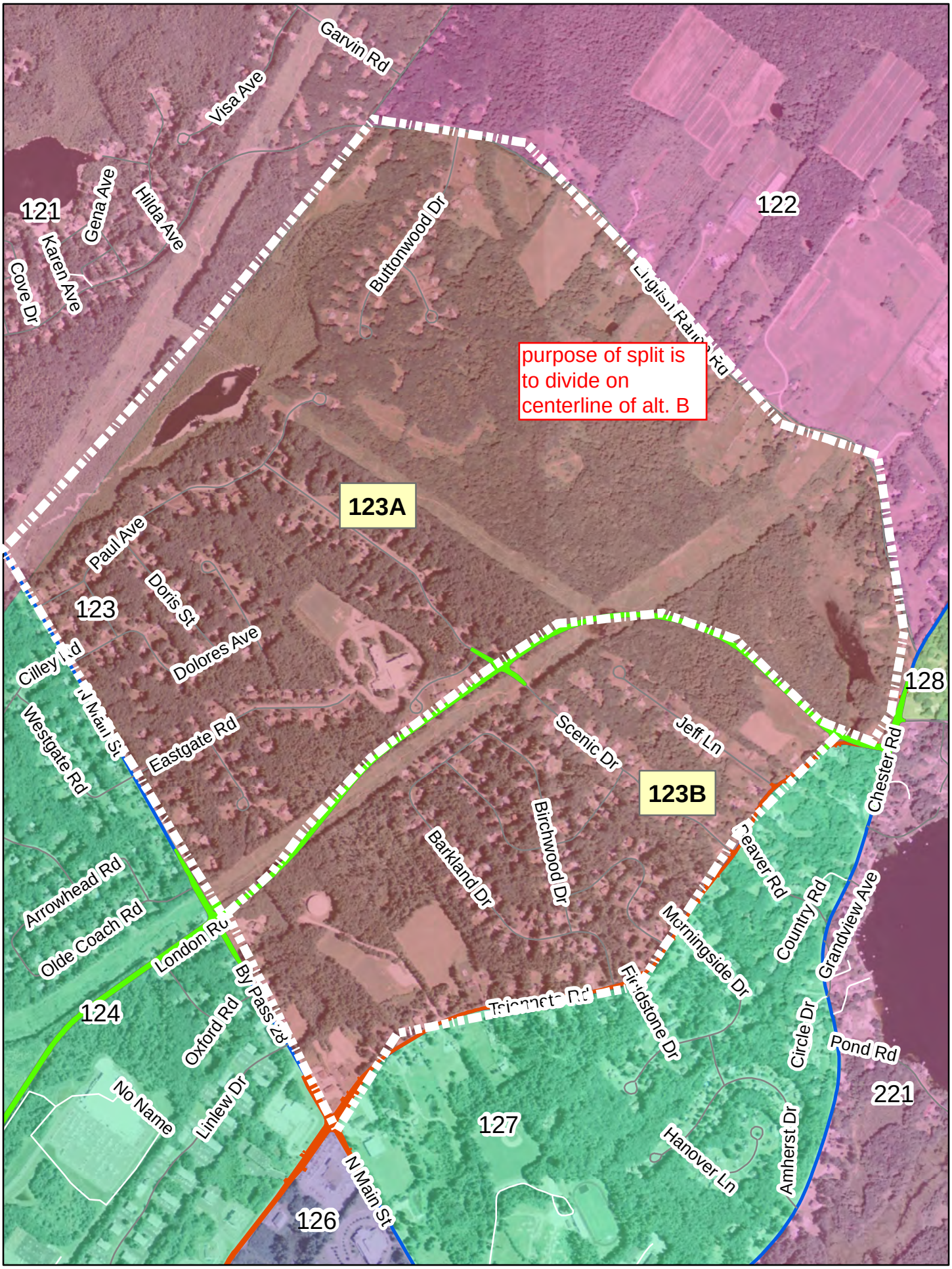
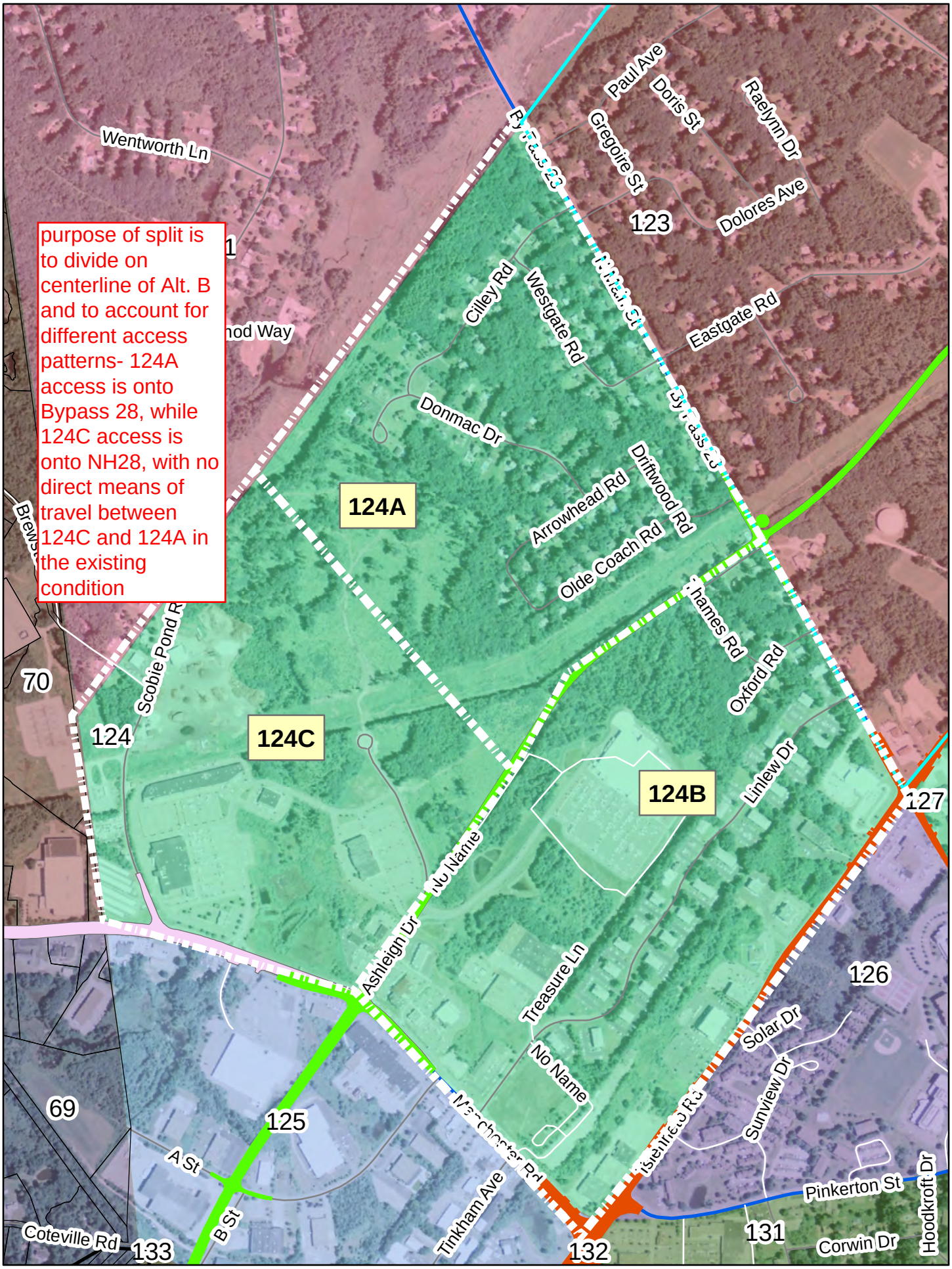
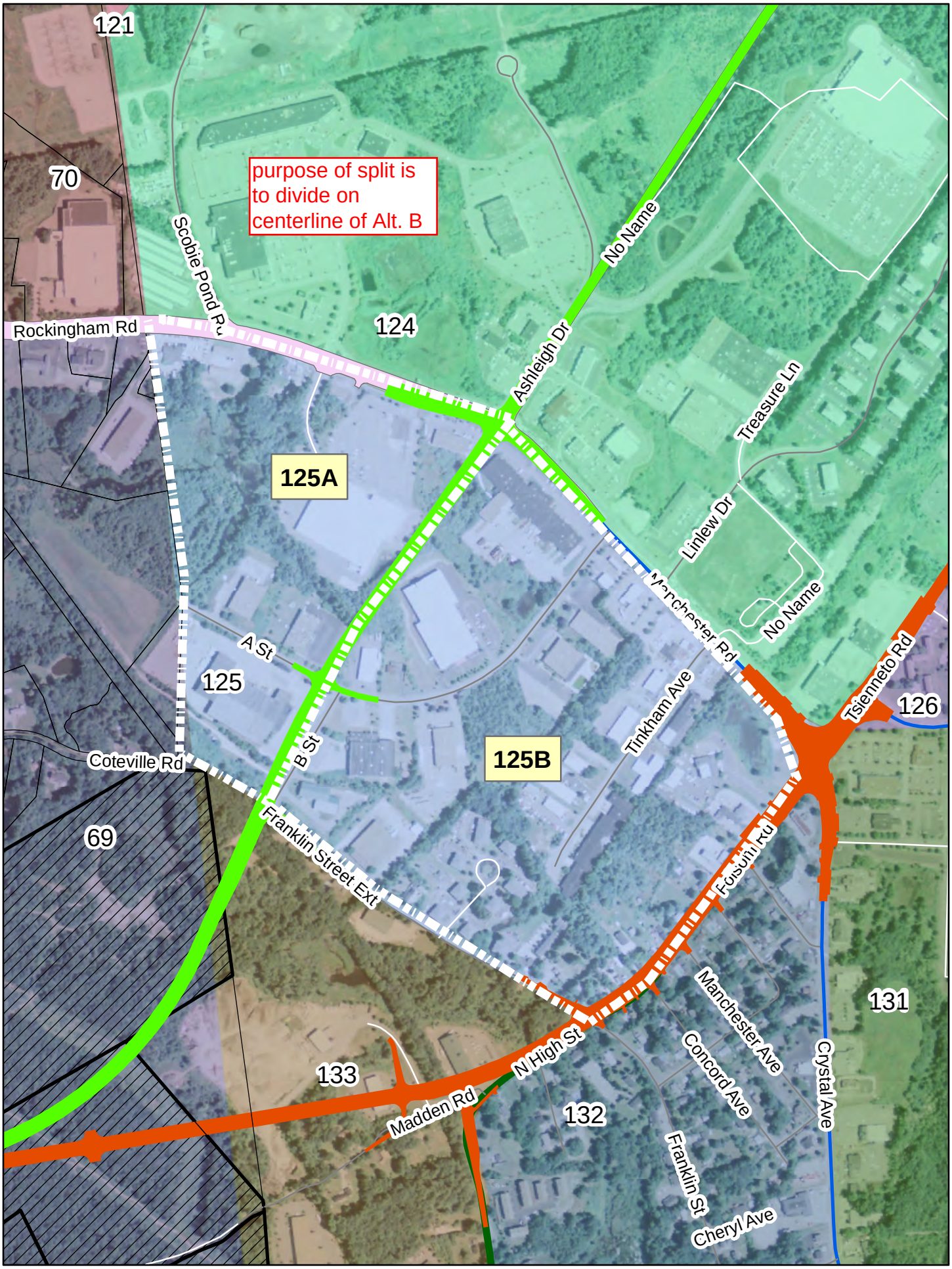
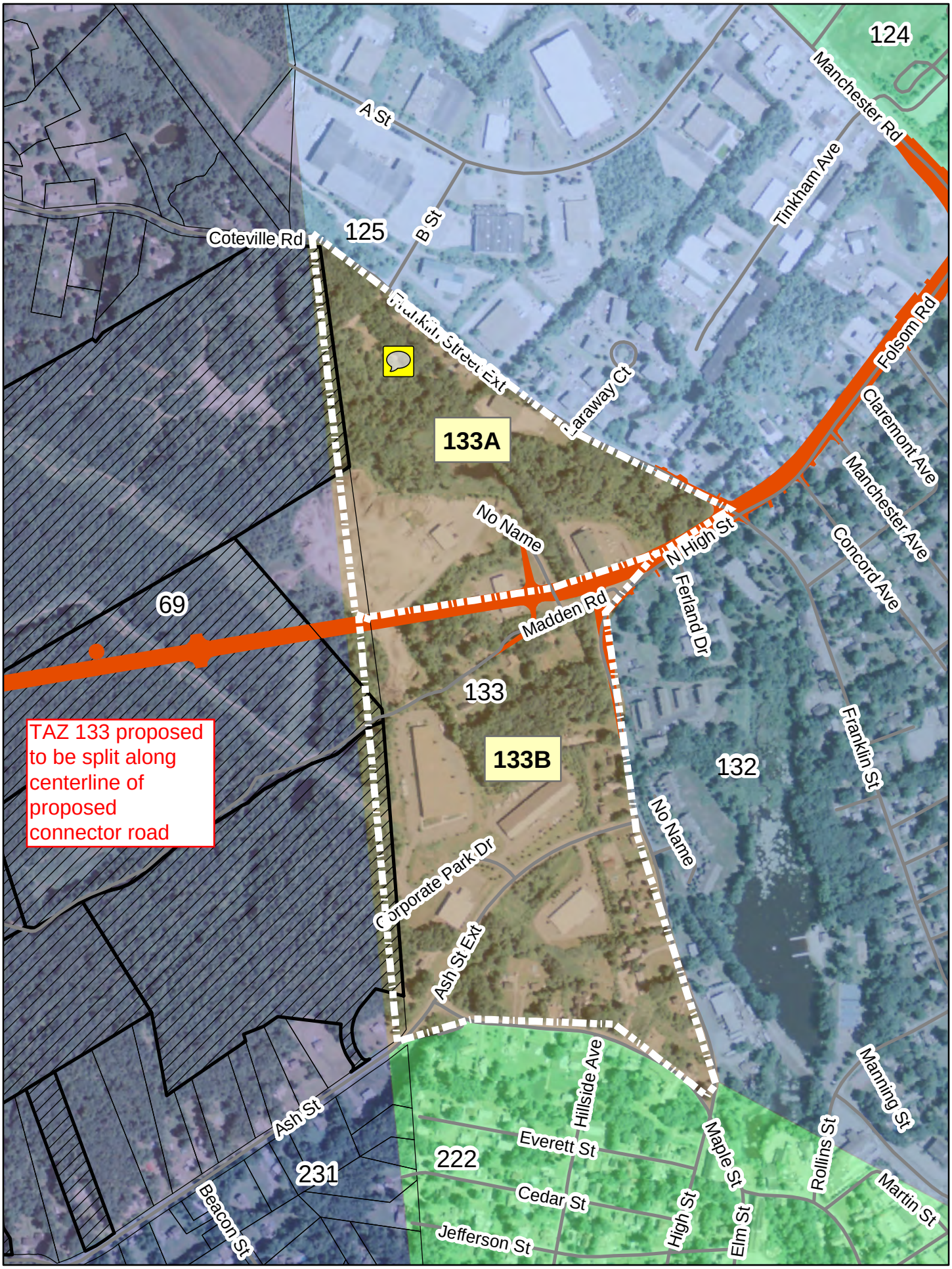

The purpose of the zone 69 split is to put the Woodmont PUD parcels in separate zones from existing development where feasible, and to split the zone along the centerline of the proposed 4A connector load.
69A
69B
69C
69
70
276
121
124
125
133
99
222
231
281
277
134


Garvin Rd
Visa Ave
Gena Ave
Hilda Ave
Karen Ave
Cove Dr
121
122
Buttonwood Dr
English Ranch Rd
purpose of split is to divide on centerline of alt. B
123A
Paul Ave
Doris St
123
Dolores Ave
Cilley Rd
N Main St
Westgate Rd
Eastgate Rd
Scenic Dr
Jeff Ln
123B
128
Chester Rd
Barkland Dr
Birchwood Dr
Beaver Rd
Country Rd
Grandview Ave
Arrowhead Rd
Olde Coach Rd
London Rd
By Pass 28
Morningside Dr
Fieldstone Dr
Circle Dr
Pond Rd
124
Oxford Rd
No Name
Linlew Dr
127
Hanover Ln
Amherst Dr
221
N Main St
126


purpose of split is to divide on centerline of Alt. B and to account for different access patterns- 124A access is onto Bypass 28, while 124C access is onto NH28, with no direct means of travel between 124C and 124A in the existing condition
124A
124B
124C
Wentworth Ln
Paul Ave
Doris St
Raelynn Dr
Gregoire St
Dolores Ave
123
Cilley Rd
Westgate Rd
Eastgate Rd
Donmac Dr
Arrowhead Rd
Driftwood Rd
Olde Coach Rd
Thames Rd
Oxford Rd
Linlew Dr
Scobie Pond Rd
70
124
127
No Name
Ashleigh Dr
Treasure Ln
126
Solar Dr
Sunview Dr
69
125
A St
B St
Tinkham Ave
Pinkerton St
Hoodkroft Dr
Coteville Rd
133
132
131
Corwin Dr


121
70
purpose of split is to divide on centerline of Alt. B
Scobie Pond Rd
No Name
Rockingham Rd
124
Ashleigh Dr
Treasure Ln
125A
Linlew Dr
No Name
Manchester Rd
A St
125
Tsienneto Rd
126
Tinkham Ave
B St
125B
Coteville Rd
69
Franklin Street Ext
Fousum Rd
Manchester Ave
131
N High St
Concord Ave
Crystal Ave
133
Madden Rd
132
Franklin St
Cheryl Ave


124
Manchester Rd
A St
Tinkham Ave
125
B St
Coteville Rd
Franklin Street Ext
Laraway Ct
Folsom Rd
Claremont Ave
133A
Manchester Ave
No Name
N High St
Concord Ave
69
Madden Rd
Ferland Dr
133
TAZ 133 proposed to be split along centerline of proposed connector road
133B
132
Franklin St
No Name
Corporate Park Dr
Ash St Ext
Hillside Ave
Manning St
Ash St
Everett St
222
Maple St
Rollins St
231
Cedar St
Martin St
Beacon St
Jefferson St
High St
Elm St

APPENDIX B PROJECT LIST

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Projects Coded in the 2040 No-Build Model

Community[1]	Project	Project #
BE	NH 101 - Widen NH 101 to 5 Lanes from NH 114 up to Wallace Rd	13953
BE	NH 101 - Widen NH 101 to 5 Lanes from Wallace Rd up to Amherst TL[2]	
BE	US 3 - Widen US 3 to 5 Lanes from Hawthorne Drive North to Manchester Airport Access Road	40664
BE-ME	F.E.E Turnpike - Improvement to Bedford Mainline Toll Plaza to Institute Open Road Tolling	16100
NA-ME-BE	F.E.E.Turnpike - Widen existing 2-Lane Sections of the Turnpike to a 3-Lane Typical From Exit 8 in Nashua to I-293 in Bedford	13761
CH	NH 102 - NH 102/North Pond Road Intersection Improvements.	
DE-LO	I-93 - Construction of I-93 Exit 4A	13065
HO	US 3/NH 28 - Widen US 3/NH 28 to 5 Lanes from Martins Ferry Rd to West Alice Ave	29611
HO	US 3/NH 28 - Construct Southern Segment of US 3/NH 28 Alternate Bypass[2]	
HO	US 3/NH 28 - Construct Northern Segment of US3/NH28 Alternate Bypass[2]	
HO	Widen US3/NH28 to 5 Lanes from Legends Dr to Hunt Street[2]	
HO	Hackett Hill Road - Reconstruction intersection of NH 3A/Hackett Hill Road	14950
HO	NH 3A - Reconstruct and Widen from Commerce Road North to Goonan Rd.	24862
LO	NH 28 - Widening NH 28 from NH 128 to Page Rd.	
LO	NH 102 - Widen NH 102 to 4 Lanes from Hudson Town Line to NH 128[2] - Lower Corridor	
LO	NH 102 - Widen NH 102 to 5 Lanes from I-93 East to Londonderry Road[2] - Upper Corridor	
LO	NH 102 - Widen NH 102 to 6 Lanes from I-93 to NH 128[2] - Central Corridor	
LO	Intersection Improvements at NH28/NH128 for Safety and Traffic Flow	
MA	I-293 - Reconstruction of Exit 4 on I-293	
MA	I-293 - Reconstruct and Widening of Exit 6 (Amoskeag)	16099A
MA	I-293 - Reconstruct Exit 7	16099B
SA-MA	I-93- Reconstruct and Widen Mainline, Environmental Impact Study and Final Design From Mass S/L in Salem to I-293 in Manchester. Capacity Improvements, Reconstruction, and Widening from North of Exit 3 to I-293	10418C
SA-MA	I-93 - NB & SB Mainline Weigh Station to Kendall	14633B
SA-MA	I-93 - Exit 4 Ramps, NB & SB Mainline, NH 102 Approach Work	14633D
SA-MA	I-93- NB & SB Mainline, Exit 5 to I-293 Split (Londonderry & Manchester)	14633H
SA-MA	I-93- NB & SB Mainline, Exit 4 and 5 (Londonderry)	14633I
SA-MA	I-93 - Exit 1 to Exit 5 - Construct 4th Lane Northbound and Southbound	14633J
SA-MA	I-93 - Final Design (PE) and ROW for I-93 Salem to Manchester	10418X
Windham	NH 111 - Corridor Improvements Within Town Center (Construction not in TYP)	40663
Windham	NH 28 - Intersection NH 28/Roulston Road Improvements	40665

Source: FY 2017 - 2020 Transportation Improvement Program, FY 2017-2026 Ten-Year Transportation Improvement Plan, and 2017-2040 SNHPC Regional Transportation Plan.

[1] BE=Bedford, CH=Chester, DE=Derry, HO=Hooksett, LO=Londonderry, MA=Manchester, NB=New Boston, RA=Raymond, SA=Salem, NA=Nashua

[2] These projects are taken from various studies and are part of the Regional Transportation Plan

Updated 10/21/2016

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APPENDIX C 2015 BASE YEAR MODEL STUDY AREA CALIBRATION RESULTS

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2015 Base Year Model Study Area Calibration Results

Location	A	B	Assign	Count	% Diff	FHWA Targets	
						Upper Limit	Lower Limit
NH 28 N. of Liberty Dr.	589	3645	15,406	13,000	18.51	25	-25
NH 102 at Derry Town line	594	3556	20,817	22,270	-6.52	25	-25
NH 28 at Derry Town line	793	1621	19,392	17,454	11.10	25	-25
Exit 5 SB Off ramp	999	3650	9,234	9,282	-0.52	29	-29
Exit 4 SB On ramp	1003	1764	8,157	9,615	-15.16	29	-29
Exit 4 NB Off ramp	1006	6519	10,389	9,843	5.55	29	-29
Exit 5 NB Off ramp	1010	3652	4,430	5,601	-20.91	29	-29
Gilcreast Rd. N. of NH 102	1334	3557	9,397	10,000	-6.03	25	-25
Ash St. E. of Londonderry Rd.	1348	3555	5,950	6,900	-13.77	29	-29
Ash St. at Londonderry Town line	1349	2125	5,936	6,765	-12.25	29	-29
Exit 4 SB On ramp EB to SB	1767	1005	4,907	5,010	-2.06	29	-29
Exit 4 SB On ramp WB to SB	1770	1004	3,637	4,648	-21.75	36	-36
NH28 Bypass N. of Tsienneto Rd.	1838	1839	9,377	11,943	-21.49	25	-25
NH28 Bypass N. of Academy Dr.	1839	3532	7,318	7,329	-0.15	29	-29
NH28 Bypass S. of Thornton Rd.	1840	2143	12,015	13,981	-14.06	25	-25
NH102 E. of NH 28 Bypass	1841	1878	7,017	7,329	-4.26	29	-29
Crystal Ave. NH 28 S of Rollins	1860	1861	13,215	13,000	1.65	25	-25
Crystal Ave. NH 28 S of Tsienneto	1862	1863	13,407	15,193	-11.76	25	-25
Folsom Rd. W. of NH 28	1863	3483	8,960	11,672	-23.24	25	-25
NH 102 E. of Griffin St.	1870	1871	18,002	16,400	9.77	25	-25
NH 102 W. of Abbot St.	1876	1877	11,128	14,350	-22.45	25	-25
Tsienneto Rd. W. of NH 102	1883	2082	5,666	5,393	5.06	29	-29
Franklin St. Ext N. of Folsom Rd.	2106	3484	1,255	1,845	-31.98	47	-47
Tsienneto Rd. E. of Pinkerton	2107	2108	14,200	14,636	-2.98	25	-25
Pinkerton St. E. of Tsienneto	2107	2109	8,776	11,672	-24.81	25	-25
Fordway over Beaver Brook	2135	2136	5,114	5,330	-4.05	29	-29
NH102 E. of Hampton Dr.	3234	1766	30,419	32,000	-4.94	22	-22
Exit 5 NB On ramp	3651	1011	9,101	9,341	-2.57	29	-29
Exit 5 SB On ramp	3653	1000	3,919	5,503	-28.78	29	-29
Exit 4 NB On ramp	6518	1007	9,550	10,045	-4.93	25	-25

Note: Traffic volumes were taken from NHDOT traffic count program, SNHPC traffic count program, and CLD|Fuss & O'Neil traffic counts for the project.

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APPENDIX D POPULATION PROJECTION [2] [5]

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Population Projection 2015-2040

Town	2015	2020	2025	2030	2035	2040
Auburn	5,315	5,560	5,828	5,959	6,033	6,048
Bedford	22,236	23,451	24,797	25,276	25,576	25,680
Candia	3,909	3,891	3,880	3,967	4,016	4,026
Chester	4,887	5,199	5,536	5,660	5,731	5,744
Deerfield	4,413	4,631	4,869	4,978	5,040	5,052
Derry	32,948	32,459	32,018	32,733	33,144	33,222
Francestown	1,562	1,576	1,597	1,628	1,647	1,654
Goffstown	17,846	18,051	18,335	18,689	18,911	18,988
Hooksett	14,473	15,403	16,508	17,089	17,532	17,823
Londonderry	24,891	25,434	26,057	26,639	26,973	27,036
Manchester	109,419	109,469	109,963	112,087	113,420	113,881
New Boston	5,457	5,818	6,214	6,334	6,409	6,435
Raymond	10,257	10,403	10,577	10,814	10,949	10,975
Weare	8,811	9,051	9,334	9,514	9,627	9,667
Windham	14,301	15,414	16,612	16,983	17,196	17,237
Total	**280,725**	**285,810**	**292,125**	**298,350**	**302,204**	**303,468**

Source: New Hampshire Office of Strategic Initiatives.

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APPENDIX E 2015 EMPLOYMENT AVERAGE

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2015 Employment Average

Town	Q1	Q2	Q3	Q4	Average
Auburn	1,706	1,766	1,806	1,852	1,783
Bedford	15,223	15,487	15,446	15,617	15,443
Candia	673	820	865	818	794
Chester	364	371	349	376	365
Deerfield	384	454	437	411	422
Derry	8,123	8,240	7,806	8,251	8,105
Francestown	94	125	136	117	118
Goffstown	3,129	3,304	3,159	3,235	3,207
Hooksett	9,275	9,496	9,591	9,700	9,516
Londonderry	12,812	13,345	13,185	13,454	13,199
Manchester	67,548	68,384	68,349	69,812	68,523
New Boston	727	756	732	794	752
Raymond	2,965	3,051	2,902	3,074	2,998
Weare	1,764	1,852	1,762	1,836	1,804
Windham	3,428	3,534	3,463	3,689	3,529

Source: New Hampshire Department of Employment Security.

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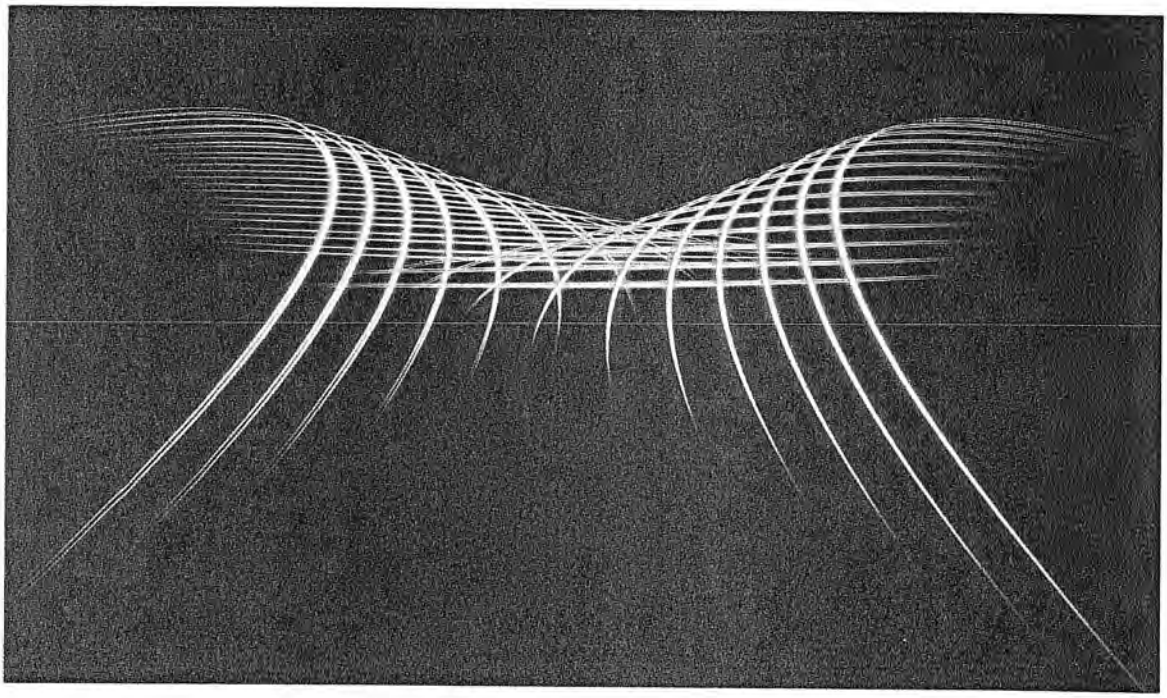
APPENDIX E: HCM 2010 LOS CRITERIA

HCM2010

HIGHWAY CAPACITY MANUAL



VOLUME 3: INTERRUPTED FLOW

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leaving basic freeway segments. Thus, the impact on the capacity of the mainline freeway most often is negligible.

This does not mean, however, that the capacity of each component segment of a facility is the same. Each segment has its own demand and demand characteristics. Demand flow rate can change at every entry and exit point along the freeway, and the percent of heavy vehicles can change too. Terrain also can change at various points along the freeway.

Changes in heavy vehicle presence can change the capacity of individual segments within a defined facility. Changes in the split of movements in a weaving segment can change its capacity. In the same way, changes in the relative demand flows at on- and off-ramps can change the location of the critical segment within a defined facility and its capacity.

As noted previously, the capacity of a freeway facility is defined as the capacity of its critical segment.

LOS: COMPONENT SEGMENTS AND THE FREEWAY FACILITY

LOS of Component Segments

Chapters 11, 12, and 13 provide methodologies to determine the LOS in basic, weaving, merge, and diverge segments. In all cases, LOS F is identified when v_p/c is greater than 1.00. Such breakdowns are easily identified, and users are referred to this chapter.

This chapter's methodology provides an analysis of breakdown conditions, including the spatial and time impacts of a breakdown. Thus, in the performance of a facility-level analysis, LOS F in a component segment can be identified (*a*) when the segment v_p/c is greater than 1.00 and (*b*) when a queue from a downstream breakdown extends into an upstream segment. The latter cannot be done by using the individual segment analysis procedures of Chapters 11, 12, and 13.

Thus, when facility-level analysis is undertaken by using the methodology of this chapter, LOS F for a component segment will be identified in two different ways:

- When v_p/c is greater than 1.00, or
- When the density is greater than 45 pc/mi/ln for basic freeway segments or 43 pc/mi/ln for weaving, merge, or diverge segments.

The latter identifies segments in which queues have formed as a result of downstream breakdowns.

LOS for a Freeway Facility

Because LOS for basic, weaving, merge, and diverge segments on a freeway is defined in terms of density, LOS for a freeway facility is also defined on the basis of density.

A facility analysis will result in a density determination and LOS for each component segment. The facility LOS will be based on the weighted average density for all segments within the defined facility. Weighting is done on the

basis of segment length and the number of lanes in each segment, as shown in Equation 10-2:

$$D_f = \frac{\sum_{i=1}^{n} D_i \cdot L_i \cdot N_i}{\sum_{i=1}^{n} L_i \cdot N_i} \quad \text{Equation 10-2}$$

where

D_f = average density for the facility (pc/mi/ln),

D_i = density for segment i (pc/mi/ln),

L_i = length of segment i (ft),

N_i = number of lanes in segment i, and

n = number of segments in the defined facility.

The LOS criteria for a freeway facility are shown in Exhibit 10-7. They are the same criteria used for basic freeway segments.

Exhibit 10-7
LOS Criteria for Freeway Facilities

Level of Service	Density (pc/mi/ln)
A	≤11
B	>11–18
C	>18–26
D	>26–35
E	>35–45
F	>45 or any component v_i/c ratio > 1.00

Use of a LOS descriptor for the overall freeway facility must be done with care. It is critical that the LOS for individual segments composing the facility also be reported. Because the overall LOS is an average, it may mask serious problems in individual segments of the facility.

This is particularly important if one or more of the component segments are operating at LOS F. As described in this chapter's methodology section, the freeway facility methodology applies models to estimate the propagation of the effects of a breakdown in time and space. Where breakdowns exist in one or more segments of a facility, the average LOS is of limited use. The average LOS applies to a specific time period, usually 15 min.

While LOS A through D are defined by using the same densities that apply to basic freeway segments, LOS F for a facility is defined as a case in which any component segment of the freeway exceeds a v_i/c ratio of 1.00 or the average density over the defined facility exceeds 45 pc/mi/ln. In such a case, this chapter's methodology allows the analyst to map the impacts of this breakdown in time and space, and close attention to the individual LOS of component segments is necessary.

18-3. The symbol Φ shown in this exhibit represents the word "phase," and the number following the symbol represents the phase number.

Exhibit 18-3 shows one way that traffic movements can be assigned to each of the eight phases. These assignments are illustrative, but they are not uncommon. Each left-turn movement is assigned to an exclusive phase. During this phase, the left-turn movement is "protected" so that it receives a green arrow indication. Each through, right-turn, and pedestrian movement combination is also assigned to an exclusive phase. The dashed arrows indicate turn movements that are served in a "permitted" manner so that the turn can be completed only after yielding the right-of-way to conflicting movements. Additional information about traffic signal controller operation is provided in Chapter 31, Signalized Intersections: Supplemental.

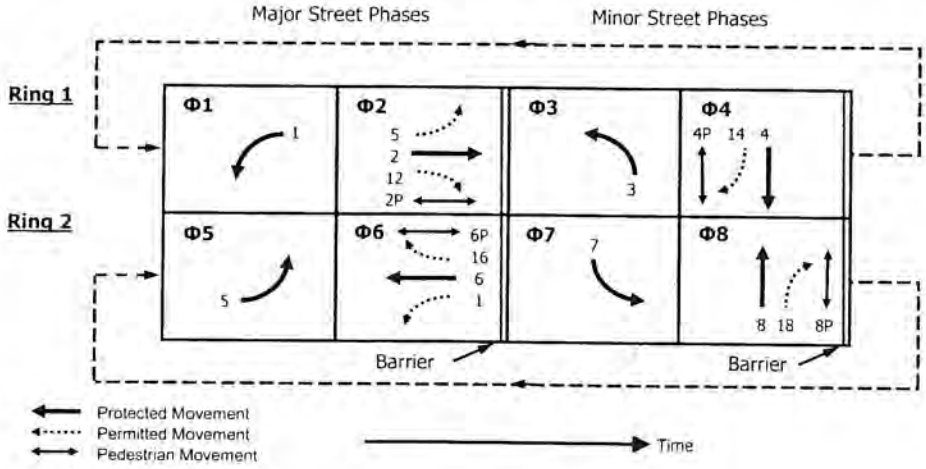

Exhibit 18-3
Dual-Ring Structure with Illustrative Movement Assignments

LOS CRITERIA

This subsection describes the LOS criteria for the automobile, pedestrian, and bicycle modes. The criteria for the automobile mode are different from those for the nonautomobile modes. Specifically, the automobile-mode criteria are based on performance measures that are field measurable and perceivable by travelers. The criteria for the nonautomobile modes are based on scores reported by travelers indicating their perception of service quality.

Automobile Mode

All uses of the word "volume" or the phrase "volume-to-capacity ratio" in this chapter refer to demand volume or demand-volume-to-capacity ratio.

LOS can be characterized for the entire intersection, each intersection approach, and each lane group. Control delay alone is used to characterize LOS for the entire intersection or an approach. Control delay *and* volume-to-capacity ratio are used to characterize LOS for a lane group. Delay quantifies the increase in travel time due to traffic signal control. It is also a surrogate measure of driver discomfort and fuel consumption. The volume-to-capacity ratio quantifies the degree to which a phase's capacity is utilized by a lane group. The following paragraphs describe each LOS.

LOS A describes operations with a control delay of 10 s/veh or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally

favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.

LOS B describes operations with control delay between 10 and 20 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.

LOS C describes operations with control delay between 20 and 35 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual *cycle failures* (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.

LOS D describes operations with control delay between 35 and 55 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.

LOS E describes operations with control delay between 55 and 80 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.

LOS F describes operations with control delay exceeding 80 s/veh or a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

A lane group can incur a delay less than 80 s/veh when the volume-to-capacity ratio exceeds 1.0. This condition typically occurs when the cycle length is short, the signal progression is favorable, or both. As a result, both the delay and volume-to-capacity ratio are considered when lane group LOS is established. A ratio of 1.0 or more indicates that cycle capacity is fully utilized and represents failure from a capacity perspective (just as delay in excess of 80 s/veh represents failure from a delay perspective).

Exhibit 18-4 lists the LOS thresholds established for the automobile mode at a signalized intersection.

Exhibit 18-4
LOS Criteria: Automobile Mode

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio[a]	
	≤1.0	>1.0
≤10	A	F
>10–20	B	F
>20–35	C	F
>35–55	D	F
>55–80	E	F
>80	F	F

Note: [a] For approach-based and intersectionwide assessments, LOS is defined solely by control delay.

1. INTRODUCTION

Two-way STOP-controlled (TWSC) intersections are common in the United States. One typical configuration is a four-leg intersection, where one street—the *major street*—is uncontrolled, while the other street—the *minor street*—is controlled by STOP signs. The other typical configuration is a three-leg intersection, where the single minor-street approach (i.e., the stem of the T configuration) is controlled by a STOP sign. Minor street approaches can be public streets or private driveways. **Chapter 19, Two-Way STOP-Controlled Intersections,** presents concepts and procedures for analyzing these types of intersections. Chapter 9 provides a glossary and list of symbols, including those used for TWSC intersections.

Three-leg intersections are considered a standard type of TWSC intersection, when the stem of the T is controlled by a STOP sign.

Capacity analysis of TWSC intersections requires a clear description and understanding of the interaction between travelers on the minor, or STOP-controlled, approach with travelers on the major street. Both gap acceptance and empirical models have been developed to describe this interaction. Procedures described in this chapter rely primarily on field measurements of TWSC performance in the United States (*1*) that have been applied to a gap acceptance model developed and refined in Germany (*2*).

INTERSECTION ANALYSIS BOUNDARIES AND TRAVEL MODES

The intersection boundaries for a TWSC intersection analysis are assumed to be those of an isolated intersection (i.e., not affected by upstream or downstream intersections), with the exception of TWSC intersections that are located within 0.25 mi of a signalized intersection (for the major-street approaches). This chapter presents methodologies to assess TWSC intersections for both pedestrians and motor vehicles. A discussion of how the procedures for motor vehicles could potentially apply to an analysis of bicycle movements is also provided.

LEVEL-OF-SERVICE CRITERIA

Level of service (LOS) for a TWSC intersection is determined by the computed or measured control delay. For motor vehicles, LOS is determined for each minor-street movement (or shared movement) as well as major-street left turns by using criteria given in Exhibit 19-1. LOS is not defined for the intersection as a whole or for major-street approaches for three primary reasons: (*a*) major-street through vehicles are assumed to experience zero delay; (*b*) the disproportionate number of major-street through vehicles at a typical TWSC intersection skews the weighted average of all movements, resulting in a very low overall average delay for all vehicles; and (*c*) the resulting low delay can mask important LOS deficiencies for minor movements. As Exhibit 19-1 notes, LOS F is assigned to the movement if the volume-to-capacity ratio for the movement exceeds 1.0, regardless of the control delay.

LOS is not defined for the major-street approaches or for the overall intersection, as major-street through vehicles are assumed to experience no delay.

The LOS criteria for TWSC intersections are somewhat different from the criteria used in Chapter 18 for signalized intersections, primarily because user perceptions differ among transportation facility types. The expectation is that a signalized intersection is designed to carry higher traffic volumes and will

present greater delay than an unsignalized intersection. Unsignalized intersections are also associated with more uncertainty for users, as delays are less predictable than they are at signals, which can reduce users' delay tolerance.

Exhibit 19-1
Level-of-Service Criteria: Automobile Mode

Control Delay (s/vehicle)	LOS by Volume-to-Capacity Ratio	
	$v/c \leq 1.0$	$v/c > 1.0$
0–10	A	F
>10–15	B	F
>15–25	C	F
>25–35	D	F
>35–50	E	F
>50	F	F

Note: The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole.

Pedestrian LOS at TWSC intersections is defined for pedestrians crossing a traffic stream not controlled by a STOP sign; it also applies to midblock pedestrian crossings. LOS criteria for pedestrians are given in Exhibit 19-2.

Exhibit 19-2
Level-of-Service Criteria: Pedestrian Mode

LOS	Control Delay (s/pedestrian)	Comments
A	0–5	Usually no conflicting traffic
B	5–10	Occasionally some delay due to conflicting traffic
C	10–20	Delay noticeable to pedestrians, but not inconveniencing
D	20–30	Delay noticeable and irritating, increased likelihood of risk taking
E	30–45	Delay approaches tolerance level, risk-taking behavior likely
F	>45	Delay exceeds tolerance level, high likelihood of pedestrian risk taking

Note: Control delay may be interpreted as s/pedestrian group if groups of pedestrians were counted as opposed to individual pedestrians.

LOS F for pedestrians occurs when there are not enough gaps of suitable size to allow waiting pedestrians to cross through traffic on the major street safely. This situation is typically evident from extremely long control delays. The method is based on a constant critical headway. In the field, however, LOS F may also appear in the form of crossing pedestrians selecting smaller-than-usual gaps. In such cases, safety could be a concern that warrants further study.

REQUIRED INPUT DATA

Analysis of a TWSC intersection requires the following data:

1. Number and configuration of lanes on each approach;
2. Percentage of heavy vehicles for each movement;
3. Either of the following:
   a. Demand flow rate for each entering vehicular movement and each pedestrian crossing movement during the peak 15 min, or
   b. Demand flow rate for each entering vehicular movement and each pedestrian crossing movement during the peak hour and a peak hour factor for the hour;
4. Special geometric factors such as
   a. Unique channelization aspects,
   b. Existence of a two-way left-turn lane or raised or striped median storage (or both),

1. INTRODUCTION

Roundabouts are intersections with a generally circular shape, characterized by yield on entry and circulation around a central island (counterclockwise in the United States). Roundabouts have been used successfully throughout the world and are being used increasingly in the United States, especially since 1990.

Chapter 21, Roundabouts, presents concepts and procedures for analyzing these intersections. National Cooperative Highway Research Program Project 3-65 (*1*) provided a comprehensive database of roundabout operations for U.S. conditions on the basis of a study of 31 sites. The procedures that follow are largely founded on that study's recommendations. These procedures allow the analyst to assess the operational performance of an existing or planned one-lane or two-lane roundabout given traffic demand levels.

21. Roundabouts

INTERSECTION ANALYSIS BOUNDARIES AND TRAVEL MODES

The analytical procedure presented in this chapter assumes that the analysis boundaries are the roundabout itself, including associated pedestrian crosswalks. Alternative tools discussed in this chapter can, in some cases, expand the analysis boundaries to include adjacent intersections. The methodology presented here includes discussion of motor vehicles, pedestrians, and bicycles.

LEVEL OF SERVICE CRITERIA

The level of service (LOS) criteria for automobiles in roundabouts are given in Exhibit 21-1. As the table notes, LOS F is assigned if the volume-to-capacity ratio of a lane exceeds 1.0 regardless of the control delay. For assessment of LOS at the approach and intersection levels, LOS is based solely on control delay.

The thresholds in Exhibit 21-1 are based on the considered judgment of the Transportation Research Board Committee on Highway Capacity and Quality of Service. As discussed later in this chapter, roundabouts share the same basic control delay formulation with two-way and all-way STOP-controlled intersections, adjusting for the effect of YIELD control. However, at the time of publication of this edition of the *Highway Capacity Manual* (HCM), no research was available on traveler perception of quality of service at roundabouts. In the absence of such research, the service measure and thresholds have been made consistent with those for other unsignalized intersections, primarily on the basis of this similar control delay formulation.

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio[a]	
	v/c ≤ 1.0	v/c >1.0
0–10	A	F
>10–15	B	F
>15–25	C	F
>25–35	D	F
>35–50	E	F
>50	F	F

Note: [a] For approaches and intersectionwide assessment, LOS is defined solely by control delay.

Exhibit 21-1
LOS Criteria: Automobile Mode

APPENDIX F: HCS 2010 FREEWAY FACILITY ANALYSES – 2015 BASE

Segment Identification Listing

Northbound Direction
Segment 1 – Basic – I-93 Mainline south of Exit 4
Segment 2 – Diverge – Exit 4 NB off-ramp
Segment 3 – Basic – I-93 Mainline between Exit 4 ramps
Segment 4 – Merge – Exit 4 NB on-ramp
Segment 5 – Basic – I-93 Mainline between Exit 4 NB on- and Exit 5 NB off-ramps
Segment 6 – Diverge – Exit 5 NB off-ramp
Segment 7 – Basic – I-93 Mainline between Exit 5 ramps
Segment 8 – Merge – Exit 5 NB on-ramp
Segment 9 – Basic – I-93 Mainline north of Exit 5

Southbound Direction
Segment 1 – Basic – I-93 Mainline north of Exit 5
Segment 2 – Diverge – Exit 5 SB off-ramp
Segment 3 – Basic – I-93 Mainline between Exit 5 ramps
Segment 4 – Merge – Exit 5 SB on-ramp
Segment 5 – Basic – I-93 Mainline between Exit 5 SB on- and Exit 4 SB off-ramps
Segment 6 – Diverge – Exit 4 SB off-ramp
Segment 7 – Basic – I-93 Mainline between Exit 4 SB off- and SB on ramp from east
Segment 8 – Merge – Exit 4 SB on-ramp from east
Segment 9 – Basic – I-93 Mainline between Exit 4 SB on-ramps
Segment 10 – Merge – Exit 4 SB on-ramp from west
Segment 11 – Basic – I-93 Mainline south of Exit 4

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	AM Peak - NB
Analysis Year	2015 Base - AM	Date	5/1/2017
Project Description	I-93 - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	9
Total Time Periods	4	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	2
2	Diverge	Diverge	b.->c	1500	2
3	Basic	Basic	c->d	2575	2
4	Merge	Merge	d->e	1500	2
5	Basic	Basic	e->f	13225	2
6	Diverge	Diverge	f->g	1500	2
7	Basic	Basic	g->h	4100	2
8	Merge	Merge	h->i	1500	2
9	Basic	Basic	i->j	5280	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.979	2022	4700	0.43	65.0	15.6	B
2	1.00	0.979	2022	4700	0.43	65.0	15.6	B
3	1.00	0.979	2022	4700	0.43	65.0	15.6	B
4	1.00	0.979	2022	4700	0.43	65.0	15.6	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.979	0.962	2022	426	4700	1900	0.43	0.22	51.3	51.3	19.7	14.3	B
2	1.00	1.00	0.979	0.962	2022	426	4700	1900	0.43	0.22	51.3	51.3	19.7	14.3	B
3	1.00	1.00	0.979	0.962	2022	426	4700	1900	0.43	0.22	51.3	51.3	19.7	14.3	B
4	1.00	1.00	0.979	0.962	2022	426	4700	1900	0.43	0.22	51.3	51.3	19.7	14.3	B

Segment 3: Basic

2015 - AM - NB

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.984	1596	4700	0.34	65.0	12.3	B
2	1.00	0.984	1596	4700	0.34	65.0	12.3	B
3	1.00	0.984	1596	4700	0.34	65.0	12.3	B
4	1.00	0.984	1596	4700	0.34	65.0	12.3	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.973	0.984	2691	1077	4700	2100	0.57	0.51	59.2	59.2	22.7	17.2	B
2	1.00	1.00	0.973	0.984	2691	1077	4700	2100	0.57	0.51	59.2	59.2	22.7	17.2	B
3	1.00	1.00	0.973	0.984	2691	1077	4700	2100	0.57	0.51	59.2	59.2	22.7	17.2	B
4	1.00	1.00	0.973	0.984	2691	1077	4700	2100	0.57	0.51	59.2	59.2	22.7	17.2	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.973	2703	4700	0.58	65.0	20.8	C
2	1.00	0.973	2703	4700	0.58	65.0	20.8	C
3	1.00	0.973	2703	4700	0.58	65.0	20.8	C
4	1.00	0.973	2703	4700	0.58	65.0	20.8	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.973	0.957	2703	428	4700	2000	0.58	0.21	54.3	54.3	24.9	23.2	C
2	1.00	1.00	0.973	0.957	2703	428	4700	2000	0.58	0.21	54.3	54.3	24.9	23.2	C
3	1.00	1.00	0.973	0.957	2703	428	4700	2000	0.58	0.21	54.3	54.3	24.9	23.2	C
4	1.00	1.00	0.973	0.957	2703	428	4700	2000	0.58	0.21	54.3	54.3	24.9	23.2	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.976	2275	4700	0.48	65.0	17.5	B
2	1.00	0.976	2275	4700	0.48	65.0	17.5	B
3	1.00	0.976	2275	4700	0.48	65.0	17.5	B
4	1.00	0.976	2275	4700	0.48	65.0	17.5	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.983	0.971	3267	1009	4700	2100	0.70	0.48	56.8	56.8	28.8	25.8	C
2	1.00	1.00	0.983	0.971	3267	1009	4700	2100	0.70	0.48	56.8	56.8	28.8	25.8	C

3	1.00	1.00	0.983	0.971	3267	1009	4700	2100	0.70	0.48	56.8	56.8	28.8	25.8	C
4	1.00	1.00	0.983	0.971	3267	1009	4700	2100	0.70	0.48	56.8	56.8	28.8	25.8	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.983	3255	4700	0.69	64.3	25.3	C
2	1.00	0.983	3255	4700	0.69	64.3	25.3	C
3	1.00	0.983	3255	4700	0.69	64.3	25.3	C
4	1.00	0.983	3255	4700	0.69	64.3	25.3	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	63.2	20.3	19.8	6.6	C
2	63.2	20.3	19.8	6.6	C
3	63.2	20.3	19.8	6.6	C
4	63.2	20.3	19.8	6.6	C

Facility Overall Results

Space Mean Speed, mi/h	63.2	Density, veh/mi/ln	19.8
Average Travel Time, min	6.6		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	AM Peak - SB
Analysis Year	2015 - Base AM (3 pgs)	Date	5/1/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	11
Total Time Periods	4	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	2
2	Diverge	Diverge	b->c	1500	2
3	Basic	Basic	c->d	3920	2
4	Merge	Merge	d->e	1500	2
5	Basic	Basic	e->f	11980	2
6	Diverge	Diverge	f->g	1500	2
7	Basic	Basic	g->h	1600	2
8	Merge	Merge	h->i	1500	2
9	Basic	Basic	i->j	900	2
10	Merge	Merge	j->k	1500	2
11	Basic	Basic	l->m	5230	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.980	3321	4700	0.71	64.0	25.9	C
2	1.00	0.980	3321	4700	0.71	64.0	25.9	C
3	1.00	0.980	3321	4700	0.71	64.0	25.9	C
4	1.00	0.980	3321	4700	0.71	64.0	25.9	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.980	0.971	3321	783	4700	2000	0.71	0.39	53.5	53.5	31.0	28.1	D
2	1.00	1.00	0.980	0.971	3321	783	4700	2000	0.71	0.39	53.5	53.5	31.0	28.1	D
3	1.00	1.00	0.980	0.971	3321	783	4700	2000	0.71	0.39	53.5	53.5	31.0	28.1	D

4	1.00	1.00	0.980	0.971	3321	783	4700	2000	0.71	0.39	53.5	53.5	31.0	28.1	D

Segment 3: Basic (2015 AM-SB)

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.983	2538	4700	0.54	65.0	19.5	C
2	1.00	0.983	2538	4700	0.54	65.0	19.5	C
3	1.00	0.983	2538	4700	0.54	65.0	19.5	C
4	1.00	0.983	2538	4700	0.54	65.0	19.5	C

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.983	0.952	3079	541	4700	2100	0.66	0.26	57.5	57.5	26.8	23.7	C
2	1.00	1.00	0.983	0.952	3079	541	4700	2100	0.66	0.26	57.5	57.5	26.8	23.7	C
3	1.00	1.00	0.983	0.952	3079	541	4700	2100	0.66	0.26	57.5	57.5	26.8	23.7	C
4	1.00	1.00	0.983	0.952	3079	541	4700	2100	0.66	0.26	57.5	57.5	26.8	23.7	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.983	3062	4700	0.65	64.8	23.6	C
2	1.00	0.983	3062	4700	0.65	64.8	23.6	C
3	1.00	0.983	3062	4700	0.65	64.8	23.6	C
4	1.00	0.983	3062	4700	0.65	64.8	23.6	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.983	0.971	3062	778	4700	1900	0.65	0.41	50.6	50.6	30.3	23.9	C
2	1.00	1.00	0.983	0.971	3062	778	4700	1900	0.65	0.41	50.6	50.6	30.3	23.9	C
3	1.00	1.00	0.983	0.971	3062	778	4700	1900	0.65	0.41	50.6	50.6	30.3	23.9	C
4	1.00	1.00	0.983	0.971	3062	778	4700	1900	0.65	0.41	50.6	50.6	30.3	23.9	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.987	2285	4700	0.49	65.0	17.6	B
2	1.00	0.987	2285	4700	0.49	65.0	17.6	B
3	1.00	0.987	2285	4700	0.49	65.0	17.6	B
4	1.00	0.987	2285	4700	0.49	65.0	17.6	B

Segment 8: Merge

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.985	0.980	2820	531	4700	2000	0.60	0.27	58.2	58.2	24.2	17.8	B
2	1.00	1.00	0.985	0.980	2820	531	4700	2000	0.60	0.27	58.2	58.2	24.2	17.8	B
3	1.00	1.00	0.985	0.980	2820	531	4700	2000	0.60	0.27	58.2	58.2	24.2	17.8	B
4	1.00	1.00	0.985	0.980	2820	531	4700	2000	0.60	0.27	58.2	58.2	24.2	17.8	B

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.985	2817	4700	0.60	65.0	21.7	C
2	1.00	0.985	2817	4700	0.60	65.0	21.7	C
3	1.00	0.985	2817	4700	0.60	65.0	21.7	C
4	1.00	0.985	2817	4700	0.60	65.0	21.7	C

Segment 10: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.984	0.980	3499	679	4700	2100	0.74	0.32	57.2	57.2	30.6	23.7	C
2	1.00	1.00	0.984	0.980	3499	679	4700	2100	0.74	0.32	57.2	57.2	30.6	23.7	C
3	1.00	1.00	0.984	0.980	3499	679	4700	2100	0.74	0.32	57.2	57.2	30.6	23.7	C
4	1.00	1.00	0.984	0.980	3499	679	4700	2100	0.74	0.32	57.2	57.2	30.6	23.7	C

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.984	3496	4700	0.74	63.3	27.6	D
2	1.00	0.984	3496	4700	0.74	63.3	27.6	D
3	1.00	0.984	3496	4700	0.74	63.3	27.6	D
4	1.00	0.984	3496	4700	0.74	63.3	27.6	D

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	62.5	24.8	24.4	6.6	C
2	62.5	24.8	24.4	6.6	C
3	62.5	24.8	24.4	6.6	C
4	62.5	24.8	24.4	6.6	C

Facility Overall Results

Space Mean Speed, mi/h	62.5	Density, veh/mi/ln	24.4
Average Travel Time, min	6.6		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	2015 PM Peak - NB
Analysis Year	2015- Base PM (3 pgs)	Date	5/1/2017
Project Description			

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	9
Total Time Periods	4	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	2
2	Diverge	Diverge	b.->c	1500	2
3	Basic	Basic	c->d	2575	2
4	Merge	Merge	d->e	1500	2
5	Basic	Basic	e->f	13225	2
6	Diverge	Diverge	f->g	1500	2
7	Basic	Basic	g->h	4100	2
8	Merge	Merge	h->i	1500	2
9	Basic	Basic	i->j	5280	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.979	3483	4700	0.74	63.3	27.5	D
2	1.00	0.979	3483	4700	0.74	63.3	27.5	D
3	1.00	0.979	3483	4700	0.74	63.3	27.5	D
4	1.00	0.979	3483	4700	0.74	63.3	27.5	D

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.979	0.995	3483	1191	4700	1900	0.74	0.63	49.7	49.7	35.0	26.9	C
2	1.00	1.00	0.979	0.995	3483	1191	4700	1900	0.74	0.63	49.7	49.7	35.0	26.9	C
3	1.00	1.00	0.979	0.995	3483	1191	4700	1900	0.74	0.63	49.7	49.7	35.0	26.9	C
4	1.00	1.00	0.979	0.995	3483	1191	4700	1900	0.74	0.63	49.7	49.7	35.0	26.9	C

Segment 3: Basic

12015 PM - NB 1

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.971	2291	4700	0.49	65.0	17.6	B
2	1.00	0.971	2291	4700	0.49	65.0	17.6	B
3	1.00	0.971	2291	4700	0.49	65.0	17.6	B
4	1.00	0.971	2291	4700	0.49	65.0	17.6	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.977	0.988	3077	800	4700	2100	0.65	0.38	58.6	58.6	26.3	20.3	C
2	1.00	1.00	0.977	0.988	3077	800	4700	2100	0.65	0.38	58.6	58.6	26.3	20.3	C
3	1.00	1.00	0.977	0.988	3077	800	4700	2100	0.65	0.38	58.6	58.6	26.3	20.3	C
4	1.00	1.00	0.977	0.988	3077	800	4700	2100	0.65	0.38	58.6	58.6	26.3	20.3	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.977	3086	4700	0.66	64.7	23.8	C
2	1.00	0.977	3086	4700	0.66	64.7	23.8	C
3	1.00	0.977	3086	4700	0.66	64.7	23.8	C
4	1.00	0.977	3086	4700	0.66	64.7	23.8	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.977	0.971	3086	474	4700	2000	0.66	0.24	54.2	54.2	28.5	26.5	C
2	1.00	1.00	0.977	0.971	3086	474	4700	2000	0.66	0.24	54.2	54.2	28.5	26.5	C
3	1.00	1.00	0.977	0.971	3086	474	4700	2000	0.66	0.24	54.2	54.2	28.5	26.5	C
4	1.00	1.00	0.977	0.971	3086	474	4700	2000	0.66	0.24	54.2	54.2	28.5	26.5	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.978	2612	4700	0.56	65.0	20.1	C
2	1.00	0.978	2612	4700	0.56	65.0	20.1	C
3	1.00	0.978	2612	4700	0.56	65.0	20.1	C
4	1.00	0.978	2612	4700	0.56	65.0	20.1	C

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.983	0.981	3384	785	4700	2100	0.72	0.37	56.5	56.5	29.9	26.8	C

2	1.00	1.00	0.983	0.981	3384	785	4700	2100	0.72	0.37	56.5	56.5	29.9	26.8	C
3	1.00	1.00	0.983	0.981	3384	785	4700	2100	0.72	0.37	56.5	56.5	29.9	26.8	C
4	1.00	1.00	0.983	0.981	3384	785	4700	2100	0.72	0.37	56.5	56.5	29.9	26.8	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.983	3383	4700	0.72	63.8	26.5	D
2	1.00	0.983	3383	4700	0.72	63.8	26.5	D
3	1.00	0.983	3383	4700	0.72	63.8	26.5	D
4	1.00	0.983	3383	4700	0.72	63.8	26.5	D

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	62.7	24.9	24.4	6.6	C
2	62.7	24.9	24.4	6.6	C
3	62.7	24.9	24.4	6.6	C
4	62.7	24.9	24.4	6.6	C

Facility Overall Results

Space Mean Speed, mi/h	62.7	Density, veh/mi/ln	24.4
Average Travel Time, min	6.6		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	2015 PM Peak - SB
Analysis Year	2015 Base - PM (3 pgs)	Date	5/1/2017
Project Description	I93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	11
Total Time Periods	4	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	2
2	Diverge	Diverge	b->c	1500	2
3	Basic	Basic	c->d	3920	2
4	Merge	Merge	d->e	1500	2
5	Basic	Basic	e->f	11980	2
6	Diverge	Diverge	f->g	1500	2
7	Basic	Basic	g->h	1600	2
8	Merge	Merge	h->i	1500	2
9	Basic	Basic	i->j	900	2
10	Merge	Merge	j->k	1500	2
11	Basic	Basic	l->m	5230	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.980	3434	4700	0.73	63.6	27.0	D
2	1.00	0.980	3434	4700	0.73	63.6	27.0	D
3	1.00	0.980	3434	4700	0.73	63.6	27.0	D
4	1.00	0.980	3434	4700	0.73	63.6	27.0	D

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.980	0.980	3434	929	4700	2000	0.73	0.46	53.2	53.2	32.3	29.1	D
2	1.00	1.00	0.980	0.980	3434	929	4700	2000	0.73	0.46	53.2	53.2	32.3	29.1	D
3	1.00	1.00	0.980	0.980	3434	929	4700	2000	0.73	0.46	53.2	53.2	32.3	29.1	D

4	1.00	1.00	0.980	0.980	3434	929	4700	2000	0.73	0.46	53.2	53.2	32.3	29.1	D

Segment 3: Basic

2015 PM - SB

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.980	2505	4700	0.53	65.0	19.3	C
2	1.00	0.980	2505	4700	0.53	65.0	19.3	C
3	1.00	0.980	2505	4700	0.53	65.0	19.3	C
4	1.00	0.980	2505	4700	0.53	65.0	19.3	C

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.980	0.977	2930	425	4700	2100	0.62	0.20	57.8	57.8	25.3	22.6	C
2	1.00	1.00	0.980	0.977	2930	425	4700	2100	0.62	0.20	57.8	57.8	25.3	22.6	C
3	1.00	1.00	0.980	0.819	3012	507	4700	2100	0.64	0.24	57.6	57.6	26.1	23.2	C
4	1.00	1.00	0.980	0.977	2930	425	4700	2100	0.62	0.20	57.8	57.8	25.3	22.6	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.980	2929	4700	0.62	64.9	22.6	C
2	1.00	0.980	2929	4700	0.62	64.9	22.6	C
3	1.00	0.980	2929	4700	0.62	64.9	22.6	C
4	1.00	0.980	2929	4700	0.62	64.9	22.6	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.980	0.985	2929	939	4700	1900	0.62	0.49	50.2	50.2	29.2	22.8	C
2	1.00	1.00	0.980	0.985	2929	939	4700	1900	0.62	0.49	50.2	50.2	29.2	22.8	C
3	1.00	1.00	0.980	0.985	2929	939	4700	1900	0.62	0.49	50.2	50.2	29.2	22.8	C
4	1.00	1.00	0.980	0.985	2929	939	4700	1900	0.62	0.49	50.2	50.2	29.2	22.8	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.978	1989	4700	0.42	65.0	15.3	B
2	1.00	0.978	1989	4700	0.42	65.0	15.3	B
3	1.00	0.978	1989	4700	0.42	65.0	15.3	B
4	1.00	0.978	1989	4700	0.42	65.0	15.3	B

Segment 8: Merge

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.978	0.980	2208	219	4700	2000	0.47	0.11	58.9	58.9	18.7	13.2	B
2	1.00	1.00	0.978	0.980	2208	219	4700	2000	0.47	0.11	58.9	58.9	18.7	13.2	B
3	1.00	1.00	0.978	0.980	2208	219	4700	2000	0.47	0.11	58.9	58.9	18.7	13.2	B
4	1.00	1.00	0.978	0.980	2208	219	4700	2000	0.47	0.11	58.9	58.9	18.7	13.2	B

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.978	2209	4700	0.47	65.0	17.0	B
2	1.00	0.978	2209	4700	0.47	65.0	17.0	B
3	1.00	0.978	2209	4700	0.47	65.0	17.0	B
4	1.00	0.978	2209	4700	0.47	65.0	17.0	B

Segment 10: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.978	0.980	2515	306	4700	2100	0.54	0.15	59.1	59.1	21.3	16.2	B
2	1.00	1.00	0.978	0.980	2515	306	4700	2100	0.54	0.15	59.1	59.1	21.3	16.2	B
3	1.00	1.00	0.978	0.980	2515	306	4700	2100	0.54	0.15	59.1	59.1	21.3	16.2	B
4	1.00	1.00	0.978	0.980	2515	306	4700	2100	0.54	0.15	59.1	59.1	21.3	16.2	B

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.978	2515	4700	0.54	65.0	19.4	C
2	1.00	0.978	2515	4700	0.54	65.0	19.4	C
3	1.00	0.978	2515	4700	0.54	65.0	19.4	C
4	1.00	0.978	2515	4700	0.54	65.0	19.4	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	62.8	22.5	22.1	6.6	C
2	62.8	22.5	22.1	6.6	C
3	62.8	22.6	22.1	6.6	C
4	62.8	22.5	22.1	6.6	C

Facility Overall Results

Space Mean Speed, mi/h	62.8	Density, veh/mi/ln	22.1
Average Travel Time, min	6.6		

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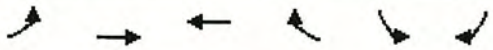
APPENDIX G-1: HCM AND SYNCHRO PRINTOUTS – SIGNALIZED INTERSECTION CAPACITY ANALYSES – 2015 AM PEAK HOURS – SYNCHRO PRINTOUTS



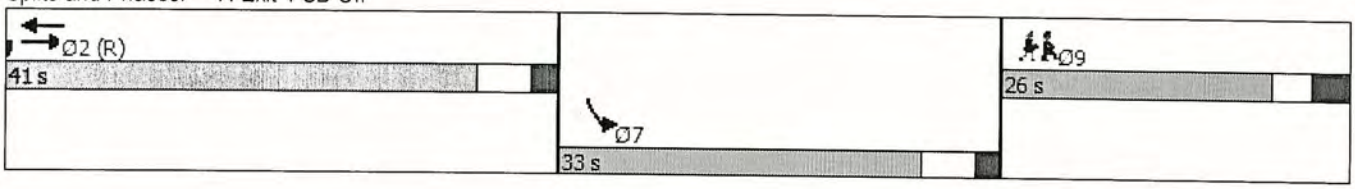
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations		↑↑	↑↑		↰	↱	
Traffic Volume (vph)	0	915	565	0	260	495	
Future Volume (vph)	0	915	565	0	260	495	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	
Frt						0.850	
Flt Protected					0.950		
Satd. Flow (prot)	0	3471	3406	0	1703	1524	
Flt Permitted					0.950		
Satd. Flow (perm)	0	3471	3406	0	1703	1524	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)						458	
Link Speed (mph)		30	30		25		
Link Distance (ft)		317	266		752		
Travel Time (s)		7.2	6.0		20.5		
Peak Hour Factor	0.93	0.93	0.88	0.88	0.89	0.89	
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%	
Adj. Flow (vph)	0	984	642	0	292	556	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	984	642	0	292	556	
Turn Type		NA	NA		Prot	Perm	
Protected Phases		2	2		7		9
Permitted Phases						7	
Detector Phase		2	2		7	7	
Switch Phase							
Minimum Initial (s)		10.0	10.0		7.0	7.0	4.0
Minimum Split (s)		41.0	41.0		33.0	33.0	14.0
Total Split (s)		41.0	41.0		33.0	33.0	26.0
Total Split (%)		41.0%	41.0%		33.0%	33.0%	26%
Maximum Green (s)		35.0	35.0		27.0	27.0	20.0
Yellow Time (s)		4.0	4.0		4.0	4.0	3.0
All-Red Time (s)		2.0	2.0		2.0	2.0	3.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		6.0	6.0	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0
Recall Mode		C-Max	C-Max		Max	Max	None
Walk Time (s)		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0	0		0	0	
Act Effct Green (s)		61.0	61.0		27.0	27.0	
Actuated g/C Ratio		0.61	0.61		0.27	0.27	
v/c Ratio		0.46	0.31		0.64	0.75	
Control Delay		11.5	1.9		39.5	13.6	
Queue Delay		0.0	0.0		0.0	0.0	
Total Delay		11.5	1.9		39.5	13.6	
LOS		B	A		D	B	
Approach Delay		11.5	1.9		22.5		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Approach LOS		B	A		C		
Queue Length 50th (ft)		165	17		164	49	
Queue Length 95th (ft)		212	m18		251	176	
Internal Link Dist (ft)		237	186		672		
Turn Bay Length (ft)							
Base Capacity (vph)		2117	2077		459	745	
Starvation Cap Reductn		0	0		0	0	
Spillback Cap Reductn		0	0		0	0	
Storage Cap Reductn		0	0		0	0	
Reduced v/c Ratio		0.46	0.31		0.64	0.75	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 12.8 Intersection LOS: B
Intersection Capacity Utilization 58.3% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Exit 4 SB Off



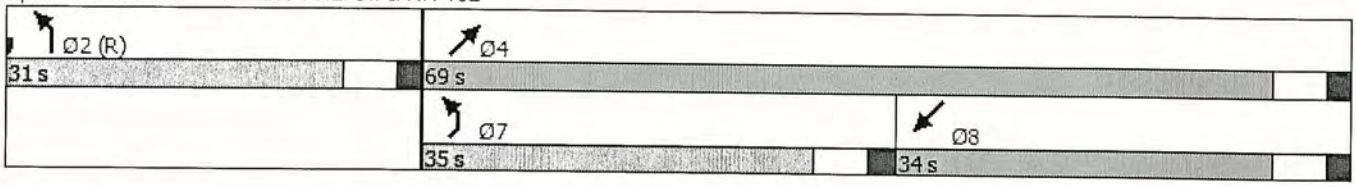
Lane Group	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations										
Traffic Volume (vph)	210	200	0	0	585	590	0	0	875	0
Future Volume (vph)	210	200	0	0	585	590	0	0	875	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	350		0	0		0
Storage Lanes	2	1	0	0	1		0	0		1
Taper Length (ft)	25		25		25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.850								
Flt Protected	0.950				0.950					
Satd. Flow (prot)	3242	1495	0	0	1719	3438	0	0	3505	1845
Flt Permitted	0.950				0.950					
Satd. Flow (perm)	3242	1495	0	0	1719	3438	0	0	3505	1845
Right Turn on Red		Yes					Yes			Yes
Satd. Flow (RTOR)		227								
Link Speed (mph)	25		30			30			30	
Link Distance (ft)	347		390			494			346	
Travel Time (s)	9.5		8.9			11.2			7.9	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Adj. Flow (vph)	239	227	0	0	622	628	0	0	951	0
Shared Lane Traffic (%)										
Lane Group Flow (vph)	239	227	0	0	622	628	0	0	951	0
Turn Type	Prot	Free			Prot	NA			NA	Free
Protected Phases	2				7	4			8	
Permitted Phases		Free								Free
Detector Phase	2				7	4			8	
Switch Phase										
Minimum Initial (s)	10.0				5.0	10.0			10.0	
Minimum Split (s)	46.0				11.0	46.0			46.0	
Total Split (s)	31.0				35.0	69.0			34.0	
Total Split (%)	31.0%				35.0%	69.0%			34.0%	
Maximum Green (s)	25.0				29.0	63.0			28.0	
Yellow Time (s)	4.0				4.0	4.0			4.0	
All-Red Time (s)	2.0				2.0	2.0			2.0	
Lost Time Adjust (s)	0.0				0.0	0.0			0.0	
Total Lost Time (s)	6.0				6.0	6.0			6.0	
Lead/Lag					Lead				Lag	
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0				3.0	3.0			3.0	
Recall Mode	C-Min				None	Min			Min	
Walk Time (s)	7.0					7.0			7.0	
Flash Dont Walk (s)	11.0					11.0			11.0	
Pedestrian Calls (#/hr)	0					0			0	
Act Effct Green (s)	12.9	100.0			41.1	75.1			28.0	
Actuated g/C Ratio	0.13	1.00			0.41	0.75			0.28	
v/c Ratio	0.57	0.15			0.88	0.24			0.97	
Control Delay	46.2	0.2			43.8	4.3			58.7	
Queue Delay	0.0	0.0			0.0	0.0			0.0	

Lane Group	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Total Delay	46.2	0.2			43.8	4.3			58.7	
LOS	D	A			D	A			E	
Approach Delay	23.8					23.9			58.7	
Approach LOS	C					C			E	
Queue Length 50th (ft)	75	0			357	52			315	
Queue Length 95th (ft)	107	0			#610	83			#448	
Internal Link Dist (ft)	267		310			414			266	
Turn Bay Length (ft)					350					
Base Capacity (vph)	810	1495			706	2582			981	
Starvation Cap Reductn	0	0			0	0			0	
Spillback Cap Reductn	0	0			0	0			0	
Storage Cap Reductn	0	0			0	0			0	
Reduced v/c Ratio	0.30	0.15			0.88	0.24			0.97	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 36.3 Intersection LOS: D
Intersection Capacity Utilization 84.6% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Exit 4 NB Off & NH 102



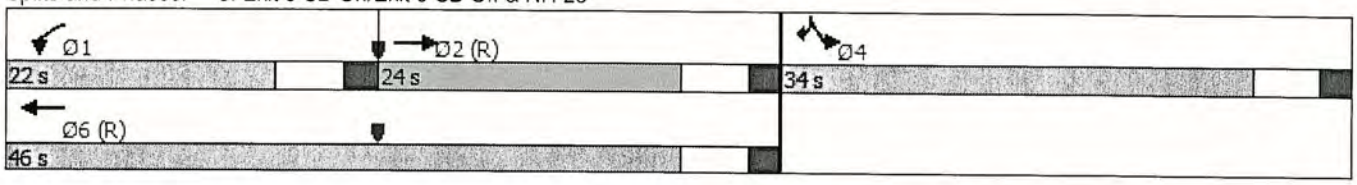
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	515	280	235	605	0	0	0	0	465	0	295
Future Volume (vph)	0	515	280	235	605	0	0	0	0	465	0	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3167	1417	1687	3374	0	0	0	0	3303	0	1524
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	3167	1417	1687	3374	0	0	0	0	3303	0	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			304									123
Link Speed (mph)		30			30			30			35	
Link Distance (ft)		410			242			486			444	
Travel Time (s)		9.3			5.5			11.0			8.6	
Peak Hour Factor	0.92	0.92	0.92	0.73	0.73	0.73	0.92	0.92	0.92	0.74	0.74	0.74
Heavy Vehicles (%)	14%	14%	14%	7%	7%	7%	2%	2%	2%	6%	6%	6%
Adj. Flow (vph)	0	560	304	322	829	0	0	0	0	628	0	399
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	560	304	322	829	0	0	0	0	628	0	399
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Detector Phase		2		1	6					4		4
Switch Phase												
Minimum Initial (s)		5.0		4.0	5.0					3.0		3.0
Minimum Split (s)		26.0		24.0	26.0					36.0		36.0
Total Split (s)		24.0		22.0	46.0					34.0		34.0
Total Split (%)		30.0%		27.5%	57.5%					42.5%		42.5%
Maximum Green (s)		18.0		16.0	40.0					28.0		28.0
Yellow Time (s)		4.0		4.0	4.0					4.0		4.0
All-Red Time (s)		2.0		2.0	2.0					2.0		2.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0					6.0		6.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?		Yes		Yes								
Vehicle Extension (s)		3.0		3.0	3.0					3.0		3.0
Recall Mode		C-Max		None	C-Max					None		None
Walk Time (s)		7.0		7.0	7.0					7.0		7.0
Flash Dont Walk (s)		11.0		11.0	11.0					11.0		11.0
Pedestrian Calls (#/hr)		0		0	0					0		0
Act Effct Green (s)		20.9	80.0	18.8	45.7					22.3		22.3
Actuated g/C Ratio		0.26	1.00	0.24	0.57					0.28		0.28
v/c Ratio		0.68	0.21	0.81	0.43					0.68		0.78
Control Delay		32.7	0.3	40.0	7.0					29.2		28.7
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		32.7	0.3	40.0	7.0					29.2		28.7
LOS		C	A	D	A					C		C
Approach Delay		21.3			16.3						29.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			B						C	
Queue Length 50th (ft)		139	0	87	46					142		127
Queue Length 95th (ft)		#212	0	#211	59					138		146
Internal Link Dist (ft)		330			162			406			364	
Turn Bay Length (ft)												
Base Capacity (vph)		828	1417	396	1929					1156		613
Starvation Cap Reductn		0	0	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.68	0.21	0.81	0.43					0.54		0.65

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 38 (48%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 22.0 Intersection LOS: C
Intersection Capacity Utilization 65.7% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Exit 5 SB On/Exit 5 SB Off & NH 28



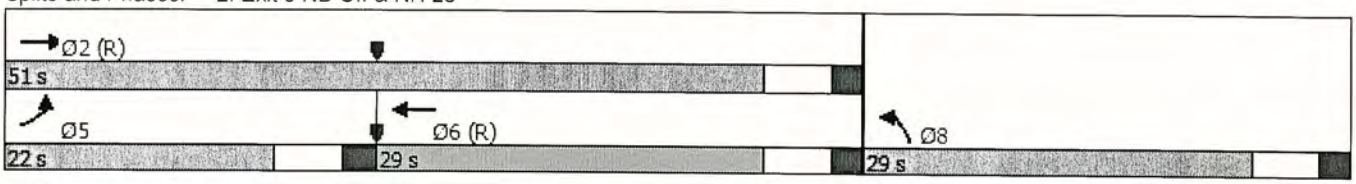
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	740	0	0	540	740	300	0	110	0	0	0
Future Volume (vph)	240	740	0	0	540	740	300	0	110	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1641	3282	0	0	3438	1538	1656	0	1482	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1641	3282	0	0	3438	1538	1656	0	1482	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						822			205			
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		196			451			450			368	
Travel Time (s)		4.5			10.3			8.8			8.4	
Peak Hour Factor	0.87	0.87	0.87	0.90	0.90	0.90	0.78	0.78	0.78	0.92	0.92	0.92
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	9%	9%	9%	2%	2%	2%
Adj. Flow (vph)	276	851	0	0	600	822	385	0	141	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	276	851	0	0	600	822	385	0	141	0	0	0
Turn Type	Prot	NA			NA	Free	Prot		Free			
Protected Phases	5	2			6		8					
Permitted Phases		2			6	Free			Free			
Detector Phase	5	2			6		8					
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0		5.0					
Minimum Split (s)	24.0	24.0			24.0		11.0					
Total Split (s)	22.0	51.0			29.0		29.0					
Total Split (%)	27.5%	63.8%			36.3%		36.3%					
Maximum Green (s)	16.0	45.0			23.0		23.0					
Yellow Time (s)	4.0	4.0			4.0		4.0					
All-Red Time (s)	2.0	2.0			2.0		2.0					
Lost Time Adjust (s)	0.0	0.0			0.0		0.0					
Total Lost Time (s)	6.0	6.0			6.0		6.0					
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	3.0	3.0			3.0		3.0					
Recall Mode	None	C-Max			C-Max		None					
Walk Time (s)	7.0	7.0			7.0							
Flash Dont Walk (s)	11.0	11.0			11.0							
Pedestrian Calls (#/hr)	0	0			0							
Act Effct Green (s)	15.7	46.6			24.9	80.0	21.4		80.0			
Actuated g/C Ratio	0.20	0.58			0.31	1.00	0.27		1.00			
v/c Ratio	0.86	0.44			0.56	0.53	0.87		0.10			
Control Delay	55.0	2.2			26.1	1.3	49.4		0.1			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	55.0	2.2			26.1	1.3	49.4		0.1			
LOS	D	A			C	A	D		A			
Approach Delay		15.1			11.8			36.2				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			B			D				
Queue Length 50th (ft)	130	0			135	0	178		0			
Queue Length 95th (ft)	#251	5			189	0	233		0			
Internal Link Dist (ft)		116			371			370			288	
Turn Bay Length (ft)												
Base Capacity (vph)	333	1913			1071	1538	476		1482			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.83	0.44			0.56	0.53	0.81		0.10			

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 17.2 Intersection LOS: B
Intersection Capacity Utilization 65.7% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Exit 5 NB Off & NH 28



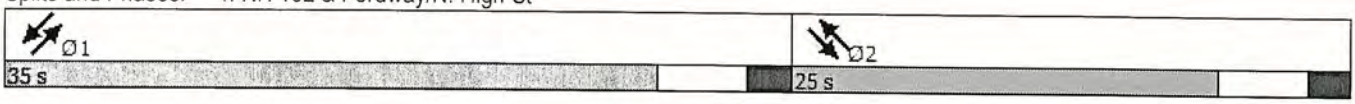
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	5	25	10	345	0	70	0	400	125	15	595	0
Future Volume (vph)	5	25	10	345	0	70	0	400	125	15	595	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.966			0.977			0.968				
Flt Protected		0.994			0.960						0.999	
Satd. Flow (prot)	0	1789	0	0	1730	0	0	1703	0	0	1808	0
Flt Permitted		0.937			0.716						0.981	
Satd. Flow (perm)	0	1686	0	0	1290	0	0	1703	0	0	1775	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			55			36				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		285			644			243			338	
Travel Time (s)		6.5			14.6			5.5			7.7	
Peak Hour Factor	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Adj. Flow (vph)	8	42	17	359	0	73	0	449	140	17	692	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	67	0	0	432	0	0	589	0	0	709	0
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		2			2			1			1	
Permitted Phases	2			2						1		
Detector Phase	2	2		2	2			1		1	1	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0			24.0		24.0	24.0	
Total Split (s)	25.0	25.0		25.0	25.0			35.0		35.0	35.0	
Total Split (%)	41.7%	41.7%		41.7%	41.7%			58.3%		58.3%	58.3%	
Maximum Green (s)	19.0	19.0		19.0	19.0			29.0		29.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag	Lag	Lag		Lag	Lag			Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes			Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Recall Mode	None	None		None	None			Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		19.1			19.1			27.3			27.3	
Actuated g/C Ratio		0.33			0.33			0.47			0.47	
v/c Ratio		0.12			0.94			0.72			0.86	
Control Delay		12.4			51.7			17.7			26.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		12.4			51.7			17.7			26.4	
LOS		B			D			B			C	
Approach Delay		12.4			51.7			17.7			26.4	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		B			D			B			C	
Queue Length 50th (ft)		13			135			145			206	
Queue Length 95th (ft)		22			#304			247			#368	
Internal Link Dist (ft)		205			564			163			258	
Turn Bay Length (ft)												
Base Capacity (vph)		562			458			866			884	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.12			0.94			0.68			0.80	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 58.4
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 29.1 Intersection LOS: C
Intersection Capacity Utilization 83.4% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: NH 102 & Fordway/N. High St



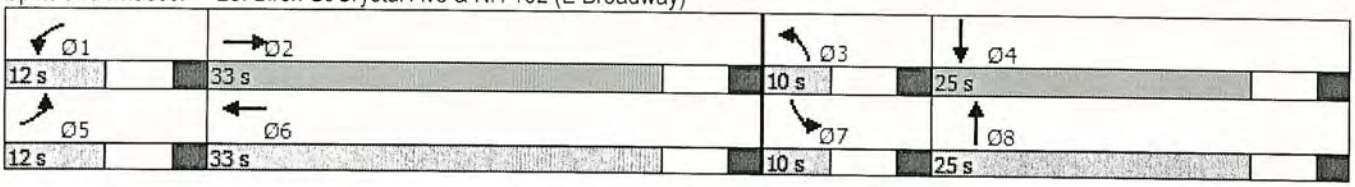
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	205	60	35	385	80	60	260	40	70	230	105
Future Volume (vph)	105	205	60	35	385	80	60	260	40	70	230	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.966			0.974			0.980				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1684	0	1703	1746	0	1719	1773	0	1703	1792	1524
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1656	1684	0	1703	1746	0	1719	1773	0	1703	1792	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			14			9				205
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		505			530			361			411	
Travel Time (s)		11.5			12.0			8.2			9.3	
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.91	0.91	0.91
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	5%	5%	5%	6%	6%	6%
Parking (#/hr)			0									
Adj. Flow (vph)	109	214	63	37	410	85	71	306	47	77	253	115
Shared Lane Traffic (%)												
Lane Group Flow (vph)	109	277	0	37	495	0	71	353	0	77	253	115
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Detector Phase	5	2		1	6		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	10.0		4.0	10.0		4.0	9.0	9.0
Minimum Split (s)	10.0	30.0		10.0	30.0		10.0	25.0		10.0	25.0	25.0
Total Split (s)	12.0	33.0		12.0	33.0		10.0	25.0		10.0	25.0	25.0
Total Split (%)	15.0%	41.3%		15.0%	41.3%		12.5%	31.3%		12.5%	31.3%	31.3%
Maximum Green (s)	6.0	27.0		6.0	27.0		4.0	19.0		4.0	19.0	19.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Min		None	Min		Min	None		Min	None	None
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)		10			10			0			10	10
Act Effct Green (s)	6.0	29.4		5.9	24.1		4.0	17.5		4.0	17.5	17.5
Actuated g/C Ratio	0.08	0.39		0.08	0.32		0.05	0.23		0.05	0.23	0.23
v/c Ratio	0.83	0.42		0.28	0.88		0.79	0.85		0.86	0.61	0.23
Control Delay	83.0	20.1		40.6	42.7		90.6	48.3		103.4	33.9	1.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	83.0	20.1		40.6	42.7		90.6	48.3		103.4	33.9	1.1
LOS	F	C		D	D		F	D		F	C	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		37.8			42.6			55.4			37.4	
Approach LOS		D			D			E			D	
Queue Length 50th (ft)	55	99		18	218		36	164		39	113	0
Queue Length 95th (ft)	#148	170		47	#385		#101	#274		#121	188	2
Internal Link Dist (ft)		425			450			281			331	
Turn Bay Length (ft)												
Base Capacity (vph)	132	663		135	634		90	453		90	452	537
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.83	0.42		0.27	0.78		0.79	0.78		0.86	0.56	0.21

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 75.9
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 43.3 — Intersection LOS: D
Intersection Capacity Utilization 70.9% — ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 23: Birch St/Crystal Ave & NH 102 (E Broadway)



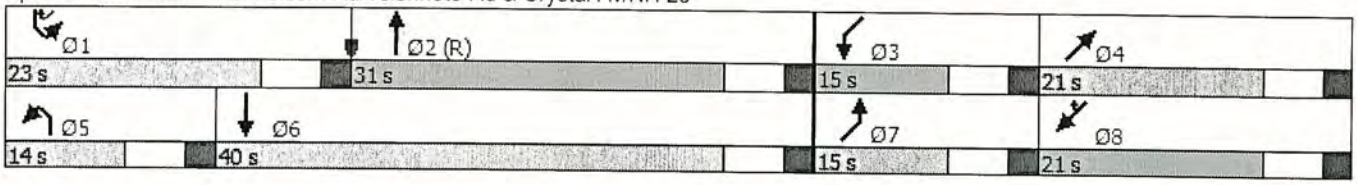
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	230	135	310	220	145	135	170	20	125	290	370
Future Volume (vph)	20	230	135	310	220	145	135	170	20	125	290	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	0		0	0		0	0		0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	3471	1553	3335	3438	1538	1752	1845	1568	1752	1845	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	3471	1553	3335	3438	1538	1752	1845	1568	1752	1845	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			255			184			327			259
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		639			394			532			387	
Travel Time (s)		14.5			9.0			12.1			8.8	
Peak Hour Factor	0.84	0.84	0.84	0.79	0.79	0.79	0.86	0.86	0.86	0.99	0.99	0.99
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	24	274	161	392	278	184	157	198	23	126	293	374
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	274	161	392	278	184	157	198	23	126	293	374
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	5	2		1	6		7	4		3	8	8 1
Permitted Phases		2	2		6	6		4	Free		8	
Detector Phase	5	2	2	1	6	6	7	4		3	8	8 1
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	6.0	8.0		7.0	8.0	
Minimum Split (s)	14.0	31.0	31.0	14.0	40.0	40.0	12.0	21.0		13.0	21.0	
Total Split (s)	14.0	31.0	31.0	23.0	40.0	40.0	15.0	21.0		15.0	21.0	
Total Split (%)	15.6%	34.4%	34.4%	25.6%	44.4%	44.4%	16.7%	23.3%		16.7%	23.3%	
Maximum Green (s)	8.0	25.0	25.0	17.0	34.0	34.0	9.0	15.0		9.0	15.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Max	C-Max	C-Max	None	Max	Max	None	None		None	None	
Walk Time (s)	5.0	5.0	5.0		5.0	5.0		5.0			5.0	
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0		0	0		0			0	
Act Effct Green (s)	8.0	26.8	26.8	15.2	34.0	34.0	9.0	15.3	90.0	8.7	15.0	36.2
Actuated g/C Ratio	0.09	0.30	0.30	0.17	0.38	0.38	0.10	0.17	1.00	0.10	0.17	0.40
v/c Ratio	0.16	0.27	0.25	0.70	0.21	0.26	0.90	0.63	0.01	0.74	0.95	0.48
Control Delay	40.5	25.5	1.2	42.0	19.5	4.1	88.0	45.1	0.0	66.1	80.3	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	40.5	25.5	1.2	42.0	19.5	4.1	88.0	45.1	0.0	66.1	80.3	8.0
LOS	D	C	A	D	B	A	F	D	A	E	F	A
Approach Delay		17.8			26.5			60.2			44.0	
Approach LOS		B			C			E			D	
Queue Length 50th (ft)	13	63	0	107	55	0	90	106	0	71	167	40
Queue Length 95th (ft)	35	90	0	131	72	27	#191	169	0	#157	#323	108
Internal Link Dist (ft)		559			314			452			307	
Turn Bay Length (ft)	150		150									
Base Capacity (vph)	154	1032	641	629	1298	695	175	312	1568	175	307	811
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.27	0.25	0.62	0.21	0.26	0.90	0.63	0.01	0.72	0.95	0.46

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 35.6 Intersection LOS: D
Intersection Capacity Utilization 58.3% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 15: Folsom Rd/Tsienneto Rd & Crystal Av/NH 28



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	50	790	0	0	655	30	5	0	5	50	0	245
Future Volume (vph)	50	790	0	0	655	30	5	0	5	50	0	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	150		150	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.993				0.850			0.850
Flt Protected	0.950							0.950			0.950	
Satd. Flow (prot)	1687	3374	0	1863	3514	0	0	1805	1615	0	1787	1599
Flt Permitted	0.950							0.720			0.751	
Satd. Flow (perm)	1687	3374	0	1863	3514	0	0	1368	1615	0	1413	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					6				109			227
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		277			755			218			433	
Travel Time (s)		6.3			17.2			5.0			9.8	
Peak Hour Factor	0.83	0.83	0.83	0.92	0.92	0.92	0.50	0.50	0.50	0.90	0.90	0.90
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	60	952	0	0	712	33	10	0	10	56	0	272
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	952	0	0	745	0	0	10	10	0	56	272
Turn Type	Prot	NA		Prot	NA		custom	NA	custom	Perm	NA	Perm
Protected Phases	5	2		1	6						4	
Permitted Phases					6		8	8	8	4		4
Detector Phase	5	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	46.0		11.0	43.0		33.0	33.0	33.0	33.0	33.0	33.0
Total Split (s)	14.0	46.0		11.0	43.0		33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	15.6%	51.1%		12.2%	47.8%		36.7%	36.7%	36.7%	36.7%	36.7%	36.7%
Maximum Green (s)	8.0	40.0		5.0	37.0		27.0	27.0	27.0	27.0	27.0	27.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
Act Effct Green (s)	9.2	67.7			55.2			10.3	10.3		10.3	10.3
Actuated g/C Ratio	0.10	0.75			0.61			0.11	0.11		0.11	0.11
v/c Ratio	0.35	0.38			0.35			0.06	0.04		0.35	0.71
Control Delay	42.8	4.9			12.9			33.0	0.2		40.6	18.9
Queue Delay	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Delay	42.8	4.9			12.9			33.0	0.2		40.6	18.9
LOS	D	A			B			C	A		D	B
Approach Delay		7.1			12.9			16.6			22.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		A			B			B			C	
Queue Length 50th (ft)	33	72			119			5	0		30	24
Queue Length 95th (ft)	63	134			m208			10	0		61	93
Internal Link Dist (ft)		197			675			138			353	
Turn Bay Length (ft)	75											
Base Capacity (vph)	173	2537			2159			410	560		423	638
Starvation Cap Reductn	0	0			0			0	0		0	0
Spillback Cap Reductn	0	0			0			0	0		0	0
Storage Cap Reductn	0	0			0			0	0		0	0
Reduced v/c Ratio	0.35	0.38			0.35			0.02	0.02		0.13	0.43

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 63 (70%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 11.7 Intersection LOS: B
Intersection Capacity Utilization 53.4% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Applebees/Linlew Dr & NH 28

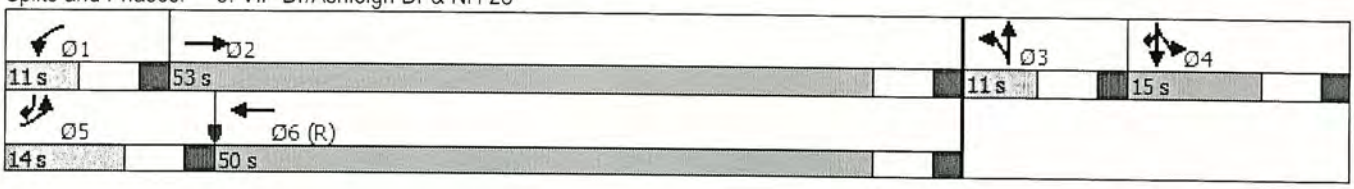
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	630	5	5	610	220	10	5	5	180	5	100
Future Volume (vph)	100	630	5	5	610	220	10	5	5	180	5	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	0		0	0		0
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (ft)	200			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.999			0.960			0.925				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.955	
Satd. Flow (prot)	3303	3402	0	1736	3332	0	1805	1758	0	1665	1674	1568
Flt Permitted	0.950			0.950			0.950			0.950	0.955	
Satd. Flow (perm)	3303	3402	0	1736	3332	0	1805	1758	0	1665	1674	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			79			7				111
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		412			486			151			343	
Travel Time (s)		9.4			11.0			3.4			7.8	
Peak Hour Factor	0.83	0.83	0.83	0.97	0.97	0.97	0.67	0.67	0.67	0.90	0.90	0.90
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Adj. Flow (vph)	120	759	6	5	629	227	15	7	7	200	6	111
Shared Lane Traffic (%)										49%		
Lane Group Flow (vph)	120	765	0	5	856	0	15	14	0	102	104	111
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases								3				
Detector Phase	5	2		1	6		3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	5.0		8.0	8.0	
Minimum Split (s)	14.0	53.0		11.0	50.0		11.0	11.0		15.0	15.0	
Total Split (s)	14.0	53.0		11.0	50.0		11.0	11.0		15.0	15.0	
Total Split (%)	15.6%	58.9%		12.2%	55.6%		12.2%	12.2%		16.7%	16.7%	
Maximum Green (s)	8.0	47.0		5.0	44.0		5.0	5.0		9.0	9.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	C-Min		None	None		None	None	
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	8.0	57.4		5.6	45.5		6.3	6.3		10.7	10.7	24.7
Actuated g/C Ratio	0.09	0.64		0.06	0.51		0.07	0.07		0.12	0.12	0.27
v/c Ratio	0.41	0.35		0.05	0.50		0.12	0.11		0.52	0.53	0.22
Control Delay	42.9	10.3		61.6	10.1		40.8	30.0		46.5	46.7	6.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	42.9	10.3		61.6	10.1		40.8	30.0		46.5	46.7	6.0
LOS	D	B		E	B		D	C		D	D	A
Approach Delay		14.7			10.4			35.6			32.4	
Approach LOS		B			B			D			C	
Queue Length 50th (ft)	33	105		3	94		8	4		57	58	0
Queue Length 95th (ft)	56	183		m8	285		20	16		110	111	38
Internal Link Dist (ft)		332			406			71			263	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	309	2212		107	1847		127	130		201	202	501
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.39	0.35		0.05	0.46		0.12	0.11		0.51	0.51	0.22

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.53
Intersection Signal Delay: 15.9 Intersection LOS: B
Intersection Capacity Utilization 54.8% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: VIP Dr/Ashleigh Dr & NH 28



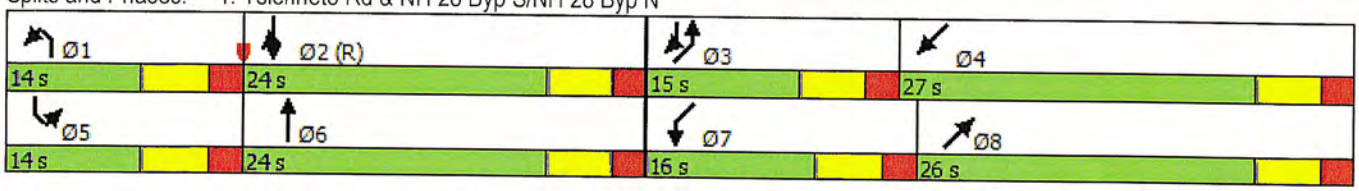
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	100	220	20	25	210	255	120	100	80	80	270	90
Future Volume (vph)	100	220	20	25	210	255	120	100	80	80	270	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	150		150	150		150
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988				0.850		0.933			0.963	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1823	0	1736	1827	1553	1770	1738	0	1787	1812	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1823	0	1736	1827	1553	1770	1738	0	1787	1812	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				202		48			20	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		481			347			479			371	
Travel Time (s)		10.9			7.9			10.9			8.4	
Peak Hour Factor	0.82	0.82	0.82	0.81	0.81	0.81	0.68	0.68	0.68	0.78	0.78	0.78
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	122	268	24	31	259	315	176	147	118	103	346	115
Shared Lane Traffic (%)												
Lane Group Flow (vph)	122	292	0	31	259	315	176	265	0	103	461	0
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases												
Detector Phase	1	6		5	2	2 3	3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	20.0		14.0	20.0		14.0	20.0		14.0	20.0	
Total Split (s)	14.0	24.0		14.0	24.0		15.0	26.0		16.0	27.0	
Total Split (%)	17.5%	30.0%		17.5%	30.0%		18.8%	32.5%		20.0%	33.8%	
Maximum Green (s)	8.0	18.0		8.0	18.0		9.0	20.0		10.0	21.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	C-Max		None	None		None	None	
Act Effct Green (s)	8.0	26.5		8.0	18.1	33.1	9.0	23.4		9.2	20.9	
Actuated g/C Ratio	0.10	0.33		0.10	0.23	0.41	0.11	0.29		0.12	0.26	
v/c Ratio	0.70	0.48		0.18	0.63	0.41	0.88	0.49		0.50	0.95	
Control Delay	57.5	26.8		35.8	35.7	7.9	77.5	24.2		41.9	59.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	57.5	26.8		35.8	35.7	7.9	77.5	24.2		41.9	59.4	
LOS	E	C		D	D	A	E	C		D	E	
Approach Delay		35.9			21.2			45.5			56.2	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		D			C			D			E	
Queue Length 50th (ft)	60	99		15	117	35	88	94		49	217	
Queue Length 95th (ft)	#119	193		36	171	71	#126	114		82	#309	
Internal Link Dist (ft)		401			267			399			291	
Turn Bay Length (ft)	150			150		150	150			150		
Base Capacity (vph)	175	607		173	414	761	199	543		223	490	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.70	0.48		0.18	0.63	0.41	0.88	0.49		0.46	0.94	

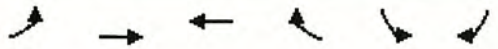
Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 39.2 Intersection LOS: D
Intersection Capacity Utilization 65.8% ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Tsienneto Rd & NH 28 Byp S/NH 28 Byp N



APPENDIX G-2: HCM AND SYNCHRO PRINTOUTS – SIGNALIZED INTERSECTION CAPACITY ANALYSES – 2015 PM PEAK HOURS – SYNCHRO PRINTOUTS



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations		↑↑	↑↑		↰	↱	
Traffic Volume (vph)	0	935	850	0	280	645	
Future Volume (vph)	0	935	850	0	280	645	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	
Frt						0.850	
Flt Protected					0.950		
Satd. Flow (prot)	0	3574	3574	0	1752	1568	
Flt Permitted					0.950		
Satd. Flow (perm)	0	3574	3574	0	1752	1568	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)						344	
Link Speed (mph)		30	30		25		
Link Distance (ft)		317	266		431		
Travel Time (s)		7.2	6.0		11.8		
Peak Hour Factor	0.92	0.92	0.89	0.89	0.92	0.92	
Heavy Vehicles (%)	1%	1%	1%	1%	3%	3%	
Adj. Flow (vph)	0	1016	955	0	304	701	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	1016	955	0	304	701	
Turn Type		NA	NA		Prot	Perm	
Protected Phases		2	2		7		9
Permitted Phases						7	
Detector Phase		2	2		7	7	
Switch Phase							
Minimum Initial (s)		10.0	10.0		7.0	7.0	4.0
Minimum Split (s)		40.0	40.0		29.0	29.0	22.0
Total Split (s)		58.0	58.0		36.0	36.0	26.0
Total Split (%)		48.3%	48.3%		30.0%	30.0%	22%
Maximum Green (s)		52.0	52.0		30.0	30.0	20.0
Yellow Time (s)		4.0	4.0		4.0	4.0	3.0
All-Red Time (s)		2.0	2.0		2.0	2.0	3.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		6.0	6.0	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0
Recall Mode		C-Max	C-Max		Max	Max	None
Walk Time (s)		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0	0		0	0	
Act Effct Green (s)		78.0	78.0		30.0	30.0	
Actuated g/C Ratio		0.65	0.65		0.25	0.25	
v/c Ratio		0.44	0.41		0.69	1.08	
Control Delay		11.0	1.8		50.4	80.9	
Queue Delay		0.0	0.0		0.0	0.0	
Total Delay		11.0	1.8		50.4	80.9	
LOS		B	A		D	F	
Approach Delay		11.0	1.8		71.7		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Approach LOS		B	A		E		
Queue Length 50th (ft)		186	15		214	~392	
Queue Length 95th (ft)		230	18		317	#630	
Internal Link Dist (ft)		237	186		351		
Turn Bay Length (ft)							
Base Capacity (vph)		2323	2323		438	650	
Starvation Cap Reductn		0	0		0	0	
Spillback Cap Reductn		0	0		0	0	
Storage Cap Reductn		0	0		0	0	
Reduced v/c Ratio		0.44	0.41		0.69	1.08	

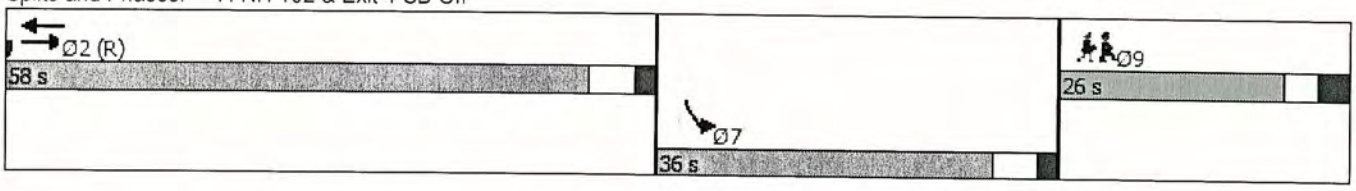
Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.08
Intersection Signal Delay: 28.5 Intersection LOS: C
Intersection Capacity Utilization 73.4% ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: NH 102 & Exit 4 SB Off



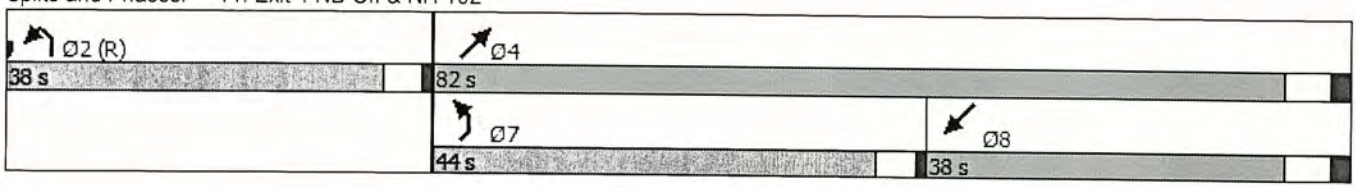
Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	580	0	605	0	0	475	740	0	0	485	0
Future Volume (vph)	580	0	605	0	0	475	740	0	0	485	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850								
Flt Protected	0.950					0.950					
Satd. Flow (prot)	3467	0	1599	0	0	1770	3539	0	0	3539	1863
Flt Permitted	0.950					0.950					
Satd. Flow (perm)	3467	0	1599	0	0	1770	3539	0	0	3539	1863
Right Turn on Red			Yes					Yes			Yes
Satd. Flow (RTOR)			499								
Link Speed (mph)		25		30			30			30	
Link Distance (ft)		347		390			361			346	
Travel Time (s)		9.5		8.9			8.2			7.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96	0.87	0.87	0.87
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	630	0	658	0	0	495	771	0	0	557	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	630	0	658	0	0	495	771	0	0	557	0
Turn Type	Prot		Free			Prot	NA			NA	Free
Protected Phases	2					7	4			8	
Permitted Phases			Free				7				Free
Detector Phase	2					7	4			8	
Switch Phase											
Minimum Initial (s)	5.0					5.0	10.0			10.0	
Minimum Split (s)	9.5					9.5	66.0			66.0	
Total Split (s)	38.0					44.0	82.0			38.0	
Total Split (%)	31.7%					36.7%	68.3%			31.7%	
Maximum Green (s)	33.5					39.5	76.0			32.0	
Yellow Time (s)	3.5					3.5	4.0			4.0	
All-Red Time (s)	1.0					1.0	2.0			2.0	
Lost Time Adjust (s)	0.0					0.0	0.0			0.0	
Total Lost Time (s)	4.5					4.5	6.0			6.0	
Lead/Lag						Lead				Lag	
Lead-Lag Optimize?						Yes				Yes	
Vehicle Extension (s)	3.0					3.0	3.0			3.0	
Recall Mode	C-Max					None	None			None	
Walk Time (s)							7.0			7.0	
Flash Dont Walk (s)							11.0			11.0	
Pedestrian Calls (#/hr)							0			0	
Act Effct Green (s)	43.4		120.0			36.7	66.1			24.9	
Actuated g/C Ratio	0.36		1.00			0.31	0.55			0.21	
v/c Ratio	0.50		0.41			0.91	0.40			0.76	
Control Delay	33.3		0.8			62.3	19.5			51.5	
Queue Delay	0.0		0.0			0.0	0.0			0.0	
Total Delay	33.3		0.8			62.3	19.5			51.5	
LOS	C		A			E	B			D	
Approach Delay		16.7					36.2			51.5	

Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		B					D			D	
Queue Length 50th (ft)	202		0			374	200			215	
Queue Length 95th (ft)	281		0			#548	242			250	
Internal Link Dist (ft)		267		310			281			266	
Turn Bay Length (ft)											
Base Capacity (vph)	1253		1599			582	2241			943	
Starvation Cap Reductn	0		0			0	0			0	
Spillback Cap Reductn	0		0			0	0			0	
Storage Cap Reductn	0		0			0	0			0	
Reduced v/c Ratio	0.50		0.41			0.85	0.34			0.59	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green
Natural Cycle: 135
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 30.9 Intersection LOS: C
Intersection Capacity Utilization 68.4% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Exit 4 NB Off & NH 102



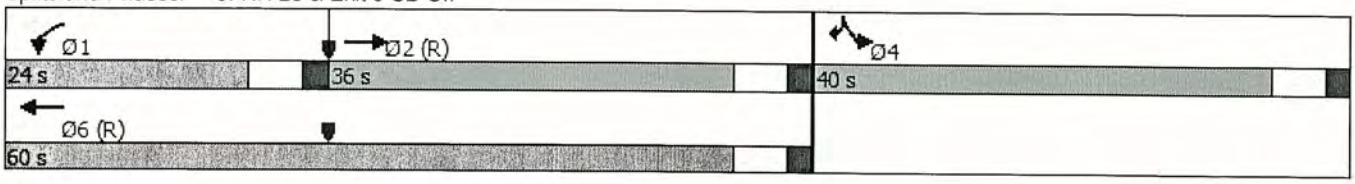
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	650	280	135	490	0	0	0	0	645	0	265
Future Volume (vph)	0	650	280	135	490	0	0	0	0	645	0	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	500		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	2		1
Taper Length (ft)	25			30			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3471	1553	1719	3438	0	0	0	0	3367	0	1553
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	3471	1553	1719	3438	0	0	0	0	3367	0	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			322									276
Link Speed (mph)		30			30			30			35	
Link Distance (ft)		410			699			486			444	
Travel Time (s)		9.3			15.9			11.0			8.6	
Peak Hour Factor	0.87	0.87	0.87	0.86	0.86	0.86	0.92	0.92	0.92	0.91	0.91	0.91
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	0	747	322	157	570	0	0	0	0	709	0	291
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	747	322	157	570	0	0	0	0	709	0	291
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free		1							
Detector Phase		2		1	6					4		4
Switch Phase												
Minimum Initial (s)		5.0		4.0	5.0					3.0		3.0
Minimum Split (s)		41.0		10.0	41.0					36.0		36.0
Total Split (s)		36.0		24.0	60.0					40.0		40.0
Total Split (%)		36.0%		24.0%	60.0%					40.0%		40.0%
Maximum Green (s)		30.0		18.0	54.0					34.0		34.0
Yellow Time (s)		4.0		4.0	4.0					4.0		4.0
All-Red Time (s)		2.0		2.0	2.0					2.0		2.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0					6.0		6.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?		Yes		Yes								
Vehicle Extension (s)		4.0		4.0	4.0					4.0		4.0
Recall Mode		C-Min		None	C-Min					None		None
Walk Time (s)		7.0			7.0					7.0		7.0
Flash Dont Walk (s)		11.0			11.0					11.0		11.0
Pedestrian Calls (#/hr)		0			0					0		0
Act Effct Green (s)		38.4	100.0	14.7	59.2					28.8		28.8
Actuated g/C Ratio		0.38	1.00	0.15	0.59					0.29		0.29
v/c Ratio		0.56	0.21	0.62	0.28					0.73		0.45
Control Delay		27.8	0.3	45.3	4.8					36.5		6.2
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		27.8	0.3	45.3	4.8					36.5		6.2
LOS		C	A	D	A					D		A
Approach Delay		19.5			13.5						27.7	
Approach LOS		B			B						C	
Queue Length 50th (ft)		197	0	101	97					207		7
Queue Length 95th (ft)		277	0	151	52					254		63
Internal Link Dist (ft)		330			619			406			364	
Turn Bay Length (ft)				500								
Base Capacity (vph)		1334	1553	309	2034					1144		710
Starvation Cap Reductn		0	0	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.56	0.21	0.51	0.28					0.62		0.41

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 48 (48%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 20.9 Intersection LOS: C
Intersection Capacity Utilization 58.8% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: NH 28 & Exit 5 SB Off



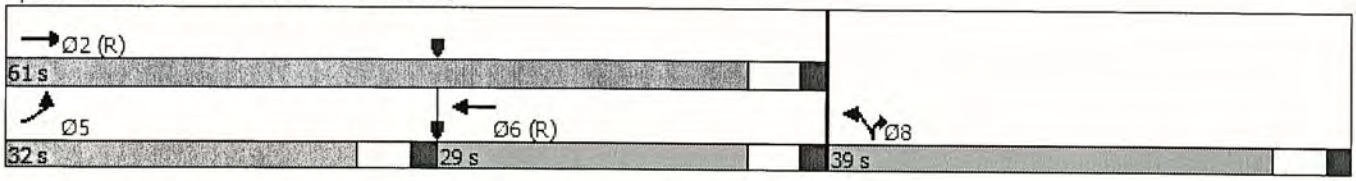
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	235	1060	0	0	425	535	220	0	240	0	0	0
Future Volume (vph)	235	1060	0	0	425	535	220	0	240	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		0	0		0	0		0	0		0
Storage Lanes	1		0	0		1	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1752	3505	0	0	3505	1568	1703	0	1524	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1752	3505	0	0	3505	1568	1703	0	1524	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						588			98			
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		699			492			450			828	
Travel Time (s)		15.9			11.2			8.8			16.1	
Peak Hour Factor	0.92	0.92	0.92	0.91	0.91	0.91	0.67	0.67	0.67	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	6%	6%	6%	2%	2%	2%
Adj. Flow (vph)	255	1152	0	0	467	588	328	0	358	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	255	1152	0	0	467	588	328	0	358	0	0	0
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		5 2				Free						
Detector Phase	5	2			6		8		8			
Switch Phase												
Minimum Initial (s)	4.0	16.0			16.0		4.0		4.0			
Minimum Split (s)	26.0	55.0			24.0		33.0		33.0			
Total Split (s)	32.0	61.0			29.0		39.0		39.0			
Total Split (%)	32.0%	61.0%			29.0%		39.0%		39.0%			
Maximum Green (s)	26.0	55.0			23.0		33.0		33.0			
Yellow Time (s)	4.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	2.0	2.0			2.0		2.0		2.0			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.0		6.0		6.0			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	4.0	4.0			4.0		4.0		4.0			
Recall Mode	None	C-Max			C-Max		None		None			
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		11.0			11.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	20.3	62.1			35.8	100.0	25.9		25.9			
Actuated g/C Ratio	0.20	0.62			0.36	1.00	0.26		0.26			
v/c Ratio	0.72	0.53			0.37	0.38	0.75		0.77			
Control Delay	48.4	12.7			27.4	0.7	44.1		35.2			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	48.4	12.7			27.4	0.7	44.1		35.2			
LOS	D	B			C	A	D		D			
Approach Delay		19.2			12.5			39.5				
Approach LOS		B			B			D				
Queue Length 50th (ft)	152	202			115	0	191		155			
Queue Length 95th (ft)	223	308			192	0	180		143			
Internal Link Dist (ft)		619			412			370			748	
Turn Bay Length (ft)	500											
Base Capacity (vph)	455	2176			1254	1568	561		568			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.56	0.53			0.37	0.38	0.58		0.63			

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 21.4 Intersection LOS: C
Intersection Capacity Utilization 58.8% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: Exit 5 NB Off & NH 28



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	15	50	5	230	0	100	0	760	150	15	415	0
Future Volume (vph)	15	50	5	230	0	100	0	760	150	15	415	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.959			0.978				
Flt Protected		0.989			0.966						0.998	
Satd. Flow (prot)	0	1842	0	0	1743	0	0	1822	0	0	1841	0
Flt Permitted		0.902			0.740						0.620	
Satd. Flow (perm)	0	1680	0	0	1335	0	0	1822	0	0	1144	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			55			24				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		170			373			245			336	
Travel Time (s)		3.9			8.5			5.6			7.6	
Peak Hour Factor	0.83	0.83	0.83	0.98	0.98	0.98	0.95	0.95	0.95	0.89	0.89	0.89
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	3%	3%	3%
Adj. Flow (vph)	18	60	6	235	0	102	0	800	158	17	466	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	84	0	0	337	0	0	958	0	0	483	0
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		2			2			1			1	
Permitted Phases	2			2						1		
Detector Phase	2	2		2	2			1		1	1	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0			24.0		24.0	24.0	
Total Split (s)	24.0	24.0		24.0	24.0			36.0		36.0	36.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%			60.0%		60.0%	60.0%	
Maximum Green (s)	18.0	18.0		18.0	18.0			30.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag	Lag	Lag		Lag	Lag			Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes			Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Recall Mode	Min	Min		Min	Min			None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		15.8			15.8			30.1			30.1	
Actuated g/C Ratio		0.27			0.27			0.52			0.52	
v/c Ratio		0.18			0.84			1.00			0.81	
Control Delay		15.9			36.6			47.1			26.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		15.9			36.6			47.1			26.8	
LOS		B			D			D			C	
Approach Delay		15.9			36.6			47.1			26.8	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		B			D			D			C	
Queue Length 50th (ft)		21			91			~382			140	
Queue Length 95th (ft)		45			#215			#591			#306	
Internal Link Dist (ft)		90			293			165			256	
Turn Bay Length (ft)												
Base Capacity (vph)		528			454			959			595	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.16			0.74			1.00			0.81	

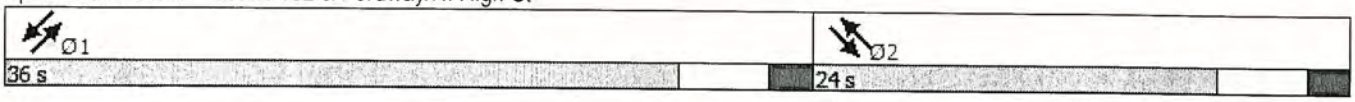
Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 57.9
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 38.5 Intersection LOS: D
Intersection Capacity Utilization 95.4% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: NH 102 & Fordway/N. High St



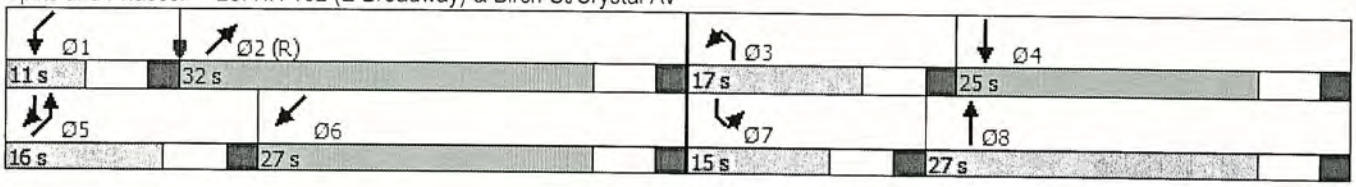
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	70	295	35	135	340	150	135	410	40	75	250	65
Future Volume (vph)	70	295	35	135	340	150	135	410	40	75	250	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984				0.850		0.987			0.969	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1815	0	1752	1845	1568	1787	1857	0	1787	1823	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1815	0	1752	1845	1568	1787	1857	0	1787	1823	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				161		6			15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		361			411			477			530	
Travel Time (s)		8.2			9.3			10.8			12.0	
Peak Hour Factor	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95	0.94	0.94	0.94
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	77	324	38	145	366	161	142	432	42	80	266	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	77	362	0	145	366	161	142	474	0	80	335	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4	5	5	2		1	6	
Permitted Phases						4						
Detector Phase	3	8		7	4	5	5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	10.0	4.0	4.0	10.0		4.0	9.0	
Minimum Split (s)	17.0	24.0		11.0	24.0	16.0	16.0	24.0		11.0	24.0	
Total Split (s)	17.0	27.0		15.0	25.0	16.0	16.0	32.0		11.0	27.0	
Total Split (%)	20.0%	31.8%		17.6%	29.4%	18.8%	18.8%	37.6%		12.9%	31.8%	
Maximum Green (s)	11.0	21.0		9.0	19.0	10.0	10.0	26.0		5.0	21.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max		None	None	
Act Effct Green (s)	8.8	19.5		8.9	22.0	37.6	9.7	29.5		5.6	22.9	
Actuated g/C Ratio	0.10	0.23		0.10	0.26	0.44	0.11	0.35		0.07	0.27	
v/c Ratio	0.43	0.86		0.79	0.77	0.21	0.70	0.73		0.68	0.67	
Control Delay	42.5	51.3		67.9	43.3	3.5	55.8	34.2		69.5	35.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	42.5	51.3		67.9	43.3	3.5	55.8	34.2		69.5	35.1	
LOS	D	D		E	D	A	E	C		E	D	
Approach Delay		49.7			39.1			39.1			41.7	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	39	178		77	184	0	74	231		43	157	
Queue Length 95th (ft)	80	#316		#174	#346	35	#155	#393		#119	#272	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Internal Link Dist (ft)		281			331			397			450	
Turn Bay Length (ft)												
Base Capacity (vph)	226	453		185	477	791	212	647		118	501	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.34	0.80		0.78	0.77	0.20	0.67	0.73		0.68	0.67	

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 0 (0%), Referenced to phase 2:NET, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 41.8 Intersection LOS: D
Intersection Capacity Utilization 87.5% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 23: NH 102 (E Broadway) & Birch St/Crystal Av



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	80	360	150	520	430	190	240	320	90	150	220	380
Future Volume (vph)	80	360	150	520	430	190	240	320	90	150	220	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	0		0	0		0	0		0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	3433	1863	1583	1770	1863	1583	1787	1881	1599
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	3433	1863	1583	1770	1863	1583	1787	1881	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			256			202			199			142
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		639			394			532			387	
Travel Time (s)		14.5			9.0			12.1			8.8	
Peak Hour Factor	0.92	0.92	0.92	0.94	0.94	0.94	0.96	0.96	0.96	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	87	391	163	553	457	202	250	333	94	158	232	400
Shared Lane Traffic (%)												
Lane Group Flow (vph)	87	391	163	553	457	202	250	333	94	158	232	400
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6		7	4		3	8	1
Permitted Phases			2			6			4			8
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	1
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	15.0	25.0	25.0	35.0	45.0	45.0	14.0	40.0	40.0	15.0	25.0	35.0
Total Split (s)	15.0	25.0	25.0	35.0	45.0	45.0	25.0	40.0	40.0	15.0	25.0	35.0
Total Split (%)	13.0%	21.7%	21.7%	30.4%	39.1%	39.1%	21.7%	34.8%	34.8%	13.0%	21.7%	30.4%
Maximum Green (s)	9.0	19.0	19.0	29.0	39.0	39.0	19.0	34.0	34.0	9.0	19.0	29.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	None	None	None	None	None	None	None	None
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	9.8	29.4	29.4	24.3	44.0	44.0	18.4	28.3	28.3	9.0	18.9	49.2
Actuated g/C Ratio	0.09	0.26	0.26	0.21	0.38	0.38	0.16	0.25	0.25	0.08	0.16	0.43
v/c Ratio	0.58	0.43	0.27	0.76	0.64	0.28	0.89	0.73	0.17	1.14	0.75	0.52
Control Delay	66.6	40.0	1.1	49.7	35.6	4.8	78.7	49.0	0.7	165.5	60.7	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	66.6	40.0	1.1	49.7	35.6	4.8	78.7	49.0	0.7	165.5	60.7	16.4
LOS	E	D	A	D	D	A	E	D	A	F	E	B
Approach Delay		33.7			36.9			53.3			59.2	
Approach LOS		C			D			D			E	
Queue Length 50th (ft)	62	130	0	199	284	0	182	224	0	~136	165	134
Queue Length 95th (ft)	#134	198	0	248	419	51	#324	310	0	#273	241	190
Internal Link Dist (ft)		559			314			452			307	
Turn Bay Length (ft)	150		150									
Base Capacity (vph)	153	905	595	865	712	730	292	550	608	139	392	824
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.43	0.27	0.64	0.64	0.28	0.86	0.61	0.15	1.14	0.59	0.49

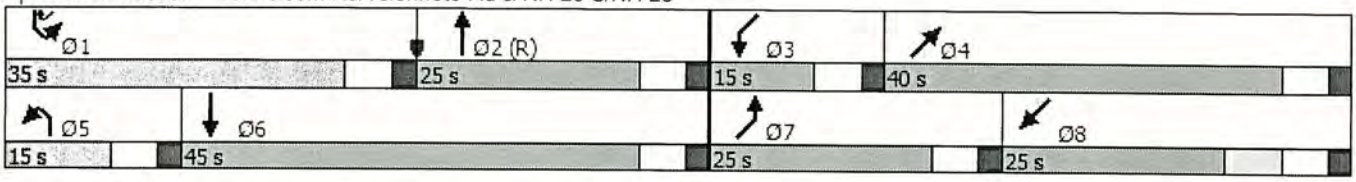
Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 115
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 44.9 Intersection LOS: D
Intersection Capacity Utilization 74.5% ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 15: Folsom Rd/Tsienneto Rd & NH 28 S/NH 28



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	170	1400	5	20	855	80	15	10	15	45	10	215
Future Volume (vph)	170	1400	5	20	855	80	15	10	15	45	10	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.987				0.850			0.850
Flt Protected	0.950			0.950				0.971			0.961	
Satd. Flow (prot)	1787	3571	0	1787	3528	0	0	1845	1615	0	1808	1599
Flt Permitted	0.950			0.950				0.774			0.747	
Satd. Flow (perm)	1787	3571	0	1787	3528	0	0	1471	1615	0	1405	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			13				172			269
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		277			755			230			387	
Travel Time (s)		6.3			17.2			5.2			8.8	
Peak Hour Factor	0.97	0.97	0.97	0.95	0.95	0.95	0.90	0.90	0.90	0.80	0.80	0.80
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	175	1443	5	21	900	84	17	11	17	56	13	269
Shared Lane Traffic (%)												
Lane Group Flow (vph)	175	1448	0	21	984	0	0	28	17	0	69	269
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4	4	4
Detector Phase	5	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	26.0	63.0		11.0	48.0		21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	26.0	63.0		11.0	48.0		21.0	21.0	21.0	21.0	21.0	21.0
Total Split (%)	27.4%	66.3%		11.6%	50.5%		22.1%	22.1%	22.1%	22.1%	22.1%	22.1%
Maximum Green (s)	20.0	57.0		5.0	42.0		15.0	15.0	15.0	15.0	15.0	15.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0			11.0		11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	0
Act Effct Green (s)	14.5	68.0		6.0	52.4			10.1	10.1		10.1	10.1
Actuated g/C Ratio	0.15	0.72		0.06	0.55			0.11	0.11		0.11	0.11
v/c Ratio	0.64	0.57		0.19	0.50			0.18	0.05		0.46	0.66
Control Delay	37.4	14.3		46.3	15.5			39.4	0.3		48.8	13.0
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Delay	37.4	14.3		46.3	15.5			39.4	0.3		48.8	13.0
LOS	D	B		D	B			D	A		D	B
Approach Delay		16.8			16.2			24.7			20.3	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		B			B			C			C	
Queue Length 50th (ft)	104	284		12	179			16	0		40	0
Queue Length 95th (ft)	m125	437		36	296			40	0		69	43
Internal Link Dist (ft)		197			675			150			307	
Turn Bay Length (ft)												
Base Capacity (vph)	376	2557		113	1951			232	399		221	479
Starvation Cap Reductn	0	0		0	0			0	0		0	0
Spillback Cap Reductn	0	0		0	0			0	0		0	0
Storage Cap Reductn	0	0		0	0			0	0		0	0
Reduced v/c Ratio	0.47	0.57		0.19	0.50			0.12	0.04		0.31	0.56

Intersection Summary

Area Type: Other
Cycle Length: 95
Actuated Cycle Length: 95
Offset: 69 (73%), Referenced to phase 2:SET and 6:NWT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 17.1 Intersection LOS: B
Intersection Capacity Utilization 67.7% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Applebee's/Linlew Dr & NH 28

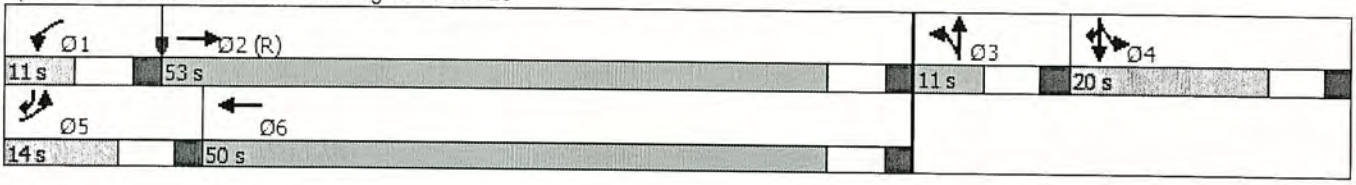
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	1095	5	5	800	260	40	10	10	345	5	135
Future Volume (vph)	110	1095	5	5	800	260	40	10	10	345	5	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	0		0	0		0
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (ft)	150			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.999			0.963			0.925				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.954	
Satd. Flow (prot)	3467	3571	0	1770	3408	0	1805	1758	0	1715	1722	1615
Flt Permitted	0.950			0.950			0.950			0.950	0.954	
Satd. Flow (perm)	3467	3571	0	1770	3408	0	1805	1758	0	1715	1722	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			62			13				108
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		877			261			151			343	
Travel Time (s)		19.9			5.9			3.4			7.8	
Peak Hour Factor	0.84	0.84	0.84	0.90	0.90	0.90	0.78	0.78	0.78	0.86	0.86	0.86
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	131	1304	6	6	889	289	51	13	13	401	6	157
Shared Lane Traffic (%)										49%		
Lane Group Flow (vph)	131	1310	0	6	1178	0	51	26	0	205	202	157
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases		2			6							
Detector Phase	5	2		1	6		3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	5.0		8.0	8.0	
Minimum Split (s)	11.0	53.0		11.0	50.0		11.0	11.0		20.0	20.0	
Total Split (s)	14.0	53.0		11.0	50.0		11.0	11.0		20.0	20.0	
Total Split (%)	14.7%	55.8%		11.6%	52.6%		11.6%	11.6%		21.1%	21.1%	
Maximum Green (s)	8.0	47.0		5.0	44.0		5.0	5.0		14.0	14.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	None		None	None		None	None	
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	7.7	58.5		5.1	47.0		5.0	5.0		13.5	13.5	27.2
Actuated g/C Ratio	0.08	0.62		0.05	0.49		0.05	0.05		0.14	0.14	0.29
v/c Ratio	0.47	0.60		0.06	0.69		0.54	0.25		0.84	0.83	0.29
Control Delay	47.4	14.0		65.0	14.8		65.2	34.5		69.2	67.0	10.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	47.4	14.0		65.0	14.8		65.2	34.5		69.2	67.0	10.9
LOS	D	B		E	B		E	C		E	E	B
Approach Delay		17.1			15.0			54.8			52.2	
Approach LOS		B			B			D			D	
Queue Length 50th (ft)	39	234		3	311		31	8		127	125	21
Queue Length 95th (ft)	63	356		m7	408		#60	29		#232	#227	63
Internal Link Dist (ft)		797			181			71			263	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	291	2198		95	1717		95	104		252	253	533
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.45	0.60		0.06	0.69		0.54	0.25		0.81	0.80	0.29

Intersection Summary

Area Type: Other
Cycle Length: 95
Actuated Cycle Length: 95
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 23.3 Intersection LOS: C
Intersection Capacity Utilization 65.9% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: VIP Dr/Ashleigh Dr & NH 28



Lanes, Volumes, Timings
1: Tsienneto Rd & NH 28 Byp NB/NH 28 Byp SB

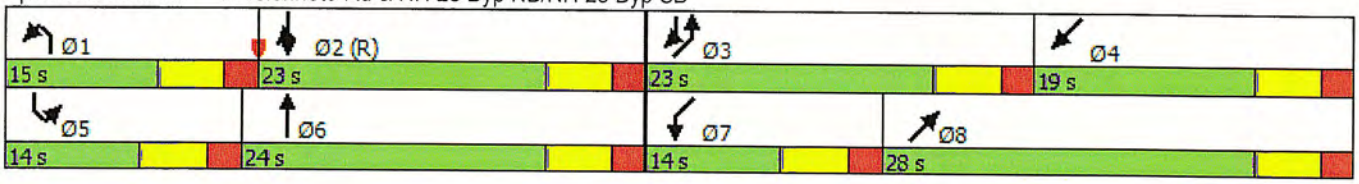
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	100	320	25	75	185	185	280	345	75	25	175	70
Future Volume (vph)	100	320	25	75	185	185	280	345	75	25	175	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	150		150	150		150
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989				0.850		0.973			0.957	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1842	0	1787	1881	1599	1805	1849	0	1805	1818	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1842	0	1787	1881	1599	1805	1849	0	1805	1818	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				195		13			21	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		481			347			479			371	
Travel Time (s)		10.9			7.9			10.9			8.4	
Peak Hour Factor	0.99	0.99	0.99	0.95	0.95	0.95	0.89	0.89	0.89	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	101	323	25	79	195	195	315	388	84	27	188	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	101	348	0	79	195	195	315	472	0	27	263	0
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases		6			2							
Detector Phase	1	6		5	2	2 3	3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	20.0		14.0	20.0		14.0	28.0		14.0	14.0	
Total Split (s)	15.0	24.0		14.0	23.0		23.0	28.0		14.0	19.0	
Total Split (%)	18.8%	30.0%		17.5%	28.8%		28.8%	35.0%		17.5%	23.8%	
Maximum Green (s)	9.0	18.0		8.0	17.0		17.0	22.0		8.0	13.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	C-Max		None	None		None	None	
Walk Time (s)								7.0				
Flash Dont Walk (s)								15.0				
Pedestrian Calls (#/hr)								0				
Act Effct Green (s)	8.7	21.8		8.0	21.2	43.5	16.3	29.4		8.0	12.7	
Actuated g/C Ratio	0.11	0.27		0.10	0.26	0.54	0.20	0.37		0.10	0.16	
v/c Ratio	0.53	0.69		0.44	0.39	0.20	0.86	0.69		0.15	0.86	
Control Delay	44.2	37.0		42.4	29.4	2.3	54.0	30.0		35.1	58.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	44.2	37.0		42.4	29.4	2.3	54.0	30.0		35.1	58.0	
LOS	D	D		D	C	A	D	C		D	E	
Approach Delay		38.6			20.4			39.6			55.9	
Approach LOS		D			C			D			E	
Queue Length 50th (ft)	48	165		38	86	0	151	162		13	119	
Queue Length 95th (ft)	97	#307		80	149	30	#278	#394		36	#248	
Internal Link Dist (ft)		401			267			399			291	
Turn Bay Length (ft)	150			150		150	150			150		
Base Capacity (vph)	199	505		178	497	970	383	687		180	313	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.51	0.69		0.44	0.39	0.20	0.82	0.69		0.15	0.84	

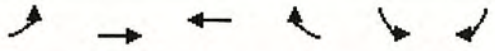
Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 37.2 Intersection LOS: D
Intersection Capacity Utilization 74.4% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Tsienneto Rd & NH 28 Byp NB/NH 28 Byp SB



APPENDIX G-3: HCM PRINTOUTS – SIGNALIZED INTERSECTION CAPACITY ANALYSES – 2015 AM AND PM PEAK HOURS



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱
Traffic Volume (vph)	0	915	565	0	260	495
Future Volume (vph)	0	915	565	0	260	495
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3406		1703	1524
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3406		1703	1524
Peak-hour factor, PHF	0.93	0.93	0.88	0.88	0.89	0.89
Adj. Flow (vph)	0	984	642	0	292	556
RTOR Reduction (vph)	0	0	0	0	0	334
Lane Group Flow (vph)	0	984	642	0	292	222
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		7	
Permitted Phases						7
Actuated Green, G (s)		61.0	61.0		27.0	27.0
Effective Green, g (s)		61.0	61.0		27.0	27.0
Actuated g/C Ratio		0.61	0.61		0.27	0.27
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2117	2077		459	411
v/s Ratio Prot		c0.28	0.19		c0.17	
v/s Ratio Perm						0.15
v/c Ratio		0.46	0.31		0.64	0.54
Uniform Delay, d1		10.6	9.4		32.2	31.2
Progression Factor		1.00	0.18		1.00	1.00
Incremental Delay, d2		0.7	0.2		6.6	5.0
Delay (s)		11.4	1.9		38.8	36.2
Level of Service		B	A		D	D
Approach Delay (s)		11.4	1.9		37.1	
Approach LOS		B	A		D	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations										
Traffic Volume (vph)	210	200	0	0	585	590	0	0	875	0
Future Volume (vph)	210	200	0	0	585	590	0	0	875	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	4.0			6.0	6.0			6.0	
Lane Util. Factor	0.97	1.00			1.00	0.95			0.95	
Frt	1.00	0.85			1.00	1.00			1.00	
Flt Protected	0.95	1.00			0.95	1.00			1.00	
Satd. Flow (prot)	3242	1495			1719	3438			3505	
Flt Permitted	0.95	1.00			0.95	1.00			1.00	
Satd. Flow (perm)	3242	1495			1719	3438			3505	
Peak-hour factor, PHF	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	239	227	0	0	622	628	0	0	951	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	239	227	0	0	622	628	0	0	951	0
Heavy Vehicles (%)	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Turn Type	Prot	Free			Prot	NA			NA	Free
Protected Phases	2				7	4			8	
Permitted Phases		Free								Free
Actuated Green, G (s)	12.9	100.0			41.1	75.1			28.0	
Effective Green, g (s)	12.9	100.0			41.1	75.1			28.0	
Actuated g/C Ratio	0.13	1.00			0.41	0.75			0.28	
Clearance Time (s)	6.0				6.0	6.0			6.0	
Vehicle Extension (s)	3.0				3.0	3.0			3.0	
Lane Grp Cap (vph)	418	1495			706	2581			981	
v/s Ratio Prot	c0.07				c0.36	0.18			c0.27	
v/s Ratio Perm		0.15								
v/c Ratio	0.57	0.15			0.88	0.24			0.97	
Uniform Delay, d1	41.0	0.0			27.2	3.8			35.6	
Progression Factor	1.00	1.00			1.00	1.00			1.00	
Incremental Delay, d2	5.6	0.2			12.4	0.0			21.3	
Delay (s)	46.5	0.2			39.6	3.8			56.9	
Level of Service	D	A			D	A			E	
Approach Delay (s)	24.0		0.0			21.6			56.9	
Approach LOS	C		A			C			E	

Intersection Summary			
HCM 2000 Control Delay	34.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	515	280	235	605	0	0	0	0	465	0	295
Future Volume (vph)	0	515	280	235	605	0	0	0	0	465	0	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3167	1417	1687	3374					3303		1524
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3167	1417	1687	3374					3303		1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.73	0.73	0.73	0.92	0.92	0.92	0.74	0.74	0.74
Adj. Flow (vph)	0	560	304	322	829	0	0	0	0	628	0	399
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	89
Lane Group Flow (vph)	0	560	304	322	829	0	0	0	0	628	0	310
Heavy Vehicles (%)	14%	14%	14%	7%	7%	7%	2%	2%	2%	6%	6%	6%
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Actuated Green, G (s)		20.9	80.0	18.8	45.7					22.3		22.3
Effective Green, g (s)		20.9	80.0	18.8	45.7					22.3		22.3
Actuated g/C Ratio		0.26	1.00	0.24	0.57					0.28		0.28
Clearance Time (s)		6.0		6.0	6.0					6.0		6.0
Vehicle Extension (s)		3.0		3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		827	1417	396	1927					920		424
v/s Ratio Prot		c0.18		c0.19	0.25					0.19		c0.20
v/s Ratio Perm			0.21									
v/c Ratio		0.68	0.21	0.81	0.43					0.68		0.73
Uniform Delay, d1		26.5	0.0	28.9	9.7					25.7		26.1
Progression Factor		1.00	1.00	0.78	0.60					1.00		1.00
Incremental Delay, d2		4.4	0.3	10.2	0.6					2.1		6.4
Delay (s)		31.0	0.3	32.7	6.4					27.8		32.5
Level of Service		C	A	C	A					C		C
Approach Delay (s)		20.2			13.8			0.0			29.6	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	740	0	0	540	740	300	0	110	0	0	0
Future Volume (vph)	240	740	0	0	540	740	300	0	110	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	4.0	6.0		4.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1641	3282			3438	1538	1656		1482			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1641	3282			3438	1538	1656		1482			
Peak-hour factor, PHF	0.87	0.87	0.87	0.90	0.90	0.90	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	276	851	0	0	600	822	385	0	141	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	276	851	0	0	600	822	385	0	141	0	0	0
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	9%	9%	9%	2%	2%	2%
Turn Type	Prot	NA			NA	Free	Prot		Free			
Protected Phases	5	2			6		8					
Permitted Phases		2			6	Free			Free			
Actuated Green, G (s)	15.7	46.6			24.9	80.0	21.4		80.0			
Effective Green, g (s)	15.7	46.6			24.9	80.0	21.4		80.0			
Actuated g/C Ratio	0.20	0.58			0.31	1.00	0.27		1.00			
Clearance Time (s)	6.0	6.0			6.0		6.0					
Vehicle Extension (s)	3.0	3.0			3.0		3.0					
Lane Grp Cap (vph)	322	1911			1070	1538	442		1482			
v/s Ratio Prot	c0.17	0.26			0.17		c0.23					
v/s Ratio Perm						c0.53			0.10			
v/c Ratio	0.86	0.45			0.56	0.53	0.87		0.10			
Uniform Delay, d1	31.1	9.4			23.0	0.0	28.0		0.0			
Progression Factor	1.05	0.16			1.00	1.00	1.00		1.00			
Incremental Delay, d2	16.2	0.6			2.1	1.3	16.9		0.1			
Delay (s)	49.0	2.1			25.1	1.3	44.9		0.1			
Level of Service	D	A			C	A	D		A			
Approach Delay (s)		13.6			11.4			32.9			0.0	
Approach LOS		B			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

6.

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	5	25	10	345	0	70	0	400	125	15	595	0
Future Volume (vph)	5	25	10	345	0	70	0	400	125	15	595	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.98			0.97			1.00	
Flt Protected		0.99			0.96			1.00			1.00	
Satd. Flow (prot)		1788			1731			1703			1807	
Flt Permitted		0.94			0.72			1.00			0.98	
Satd. Flow (perm)		1685			1291			1703			1776	
Peak-hour factor, PHF	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	8	42	17	359	0	73	0	449	140	17	692	0
RTOR Reduction (vph)	0	11	0	0	37	0	0	19	0	0	0	0
Lane Group Flow (vph)	0	56	0	0	395	0	0	570	0	0	709	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		2			2			1			1	
Permitted Phases	2			2						1		
Actuated Green, G (s)		19.1			19.1			27.3			27.3	
Effective Green, g (s)		19.1			19.1			27.3			27.3	
Actuated g/C Ratio		0.33			0.33			0.47			0.47	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		551			422			796			830	
v/s Ratio Prot								0.33				
v/s Ratio Perm		0.03			c0.31						c0.40	
v/c Ratio		0.10			0.94			0.72			0.85	
Uniform Delay, d1		13.7			19.1			12.4			13.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			28.1			3.1			8.5	
Delay (s)		13.8			47.1			15.5			22.3	
Level of Service		B			D			B			C	
Approach Delay (s)		13.8			47.1			15.5			22.3	
Approach LOS		B			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	58.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

7.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	205	60	35	385	80	60	260	40	70	230	105
Future Volume (vph)	105	205	60	35	385	80	60	260	40	70	230	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.97		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1656	1684		1703	1746		1719	1773		1703	1792	1524
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1656	1684		1703	1746		1719	1773		1703	1792	1524
Peak-hour factor, PHF	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.91	0.91	0.91
Adj. Flow (vph)	109	214	62	37	410	85	71	306	47	77	253	115
RTOR Reduction (vph)	0	13	0	0	9	0	0	7	0	0	0	89
Lane Group Flow (vph)	109	264	0	37	486	0	71	346	0	77	253	26
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	5%	5%	5%	6%	6%	6%
Parking (#/hr)			0									
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	6.0	29.3		3.4	26.7		4.0	17.5		4.0	17.5	17.5
Effective Green, g (s)	6.0	29.3		3.4	26.7		4.0	17.5		4.0	17.5	17.5
Actuated g/C Ratio	0.08	0.37		0.04	0.34		0.05	0.22		0.05	0.22	0.22
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	127	630		74	596		87	396		87	401	341
v/s Ratio Prot	c0.07	c0.16		0.02	c0.28		0.04	c0.20		c0.05	0.14	
v/s Ratio Perm												0.02
v/c Ratio	0.86	0.42		0.50	0.82		0.82	0.87		0.89	0.63	0.08
Uniform Delay, d1	35.7	18.1		36.6	23.5		36.7	29.3		36.9	27.4	24.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	40.1	0.5		5.2	8.4		42.3	18.7		59.7	3.2	0.1
Delay (s)	75.7	18.6		41.8	31.9		79.0	48.0		96.6	30.7	24.1
Level of Service	E	B		D	C		E	D		F	C	C
Approach Delay (s)		34.7			32.6			53.2			40.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	39.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	78.2	Sum of lost time (s)	24.0
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	230	135	310	220	145	135	170	20	125	290	370
Future Volume (vph)	20	230	135	310	220	145	135	170	20	125	290	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	3471	1553	3335	3438	1538	1752	1845	1568	1752	1845	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1736	3471	1553	3335	3438	1538	1752	1845	1568	1752	1845	1568
Peak-hour factor, PHF	0.84	0.84	0.84	0.79	0.79	0.79	0.86	0.86	0.86	0.99	0.99	0.99
Adj. Flow (vph)	24	274	161	392	278	184	157	198	23	126	293	374
RTOR Reduction (vph)	0	0	113	0	0	114	0	0	0	0	0	155
Lane Group Flow (vph)	24	274	48	392	278	70	157	198	23	126	293	219
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	5	2		1	6		7	4		3	8	8 1
Permitted Phases		2	2		6	6		4	Free		8	
Actuated Green, G (s)	8.0	26.8	26.8	15.2	34.0	34.0	9.0	15.3	90.0	8.7	15.0	36.2
Effective Green, g (s)	8.0	26.8	26.8	15.2	34.0	34.0	9.0	15.3	90.0	8.7	15.0	36.2
Actuated g/C Ratio	0.09	0.30	0.30	0.17	0.38	0.38	0.10	0.17	1.00	0.10	0.17	0.40
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	154	1033	462	563	1298	581	175	313	1568	169	307	630
v/s Ratio Prot	0.01	c0.08		c0.12	0.08		c0.09	0.11		0.07	c0.16	0.14
v/s Ratio Perm			0.03			0.05			c0.01			
v/c Ratio	0.16	0.27	0.10	0.70	0.21	0.12	0.90	0.63	0.01	0.75	0.95	0.35
Uniform Delay, d1	37.9	24.1	22.9	35.2	19.0	18.2	40.0	34.7	0.0	39.6	37.2	18.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.6	0.5	3.7	0.4	0.4	39.8	4.1	0.0	16.3	39.0	0.3
Delay (s)	40.0	24.7	23.3	39.0	19.3	18.7	79.8	38.9	0.0	55.9	76.1	19.0
Level of Service	D	C	C	D	B	B	E	D	A	E	E	B
Approach Delay (s)		25.0			28.2			53.5			46.0	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	37.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: Applebees/Linlew Dr & NH 28

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	50	790	0	0	655	30	5	0	5	50	0	245
Future Volume (vph)	50	790	0	0	655	30	5	0	5	50	0	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00			0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00			1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1687	3374			3516			1805	1615		1787	1599
Flt Permitted	0.95	1.00			1.00			0.72	1.00		0.75	1.00
Satd. Flow (perm)	1687	3374			3516			1369	1615		1413	1599
Peak-hour factor, PHF	0.83	0.83	0.83	0.92	0.92	0.92	0.50	0.50	0.50	0.90	0.90	0.90
Adj. Flow (vph)	60	952	0	0	712	33	10	0	10	56	0	272
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	9	0	0	201
Lane Group Flow (vph)	60	952	0	0	743	0	0	10	1	0	56	71
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		custom	NA	custom	Perm	NA	Perm
Protected Phases	5	2		1	6						4	
Permitted Phases					6		8	8	8	4		4
Actuated Green, G (s)	7.6	67.7			54.1			10.3	10.3		10.3	10.3
Effective Green, g (s)	7.6	67.7			54.1			10.3	10.3		10.3	10.3
Actuated g/C Ratio	0.08	0.75			0.60			0.11	0.11		0.11	0.11
Clearance Time (s)	6.0	6.0			6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	142	2537			2113			156	184		161	182
v/s Ratio Prot	0.04	c0.28			0.21							
v/s Ratio Perm								0.01	0.00		0.04	c0.04
v/c Ratio	0.42	0.38			0.35			0.06	0.01		0.35	0.39
Uniform Delay, d1	39.1	3.8			9.1			35.6	35.3		36.8	36.9
Progression Factor	1.00	1.00			1.20			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.0	0.4			0.1			0.2	0.0		1.3	1.4
Delay (s)	41.1	4.3			11.0			35.7	35.3		38.1	38.3
Level of Service	D	A			B			D	D		D	D
Approach Delay (s)		6.5			11.0			35.5			38.3	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
9: VIP Dr/Ashleigh Dr & NH 28

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	630	5	5	610	220	10	5	5	180	5	100
Future Volume (vph)	100	630	5	5	610	220	10	5	5	180	5	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00		1.00	0.96		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	3303	3402		1736	3333		1805	1758		1665	1674	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	3303	3402		1736	3333		1805	1758		1665	1674	1568
Peak-hour factor, PHF	0.83	0.83	0.83	0.97	0.97	0.97	0.67	0.67	0.67	0.90	0.90	0.90
Adj. Flow (vph)	120	759	6	5	629	227	15	7	7	200	6	111
RTOR Reduction (vph)	0	0	0	0	41	0	0	7	0	0	0	81
Lane Group Flow (vph)	120	765	0	5	815	0	15	7	0	102	104	30
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases								3				
Actuated Green, G (s)	8.0	50.2		1.0	43.2		4.1	4.1		10.7	10.7	24.7
Effective Green, g (s)	8.0	50.2		1.0	43.2		4.1	4.1		10.7	10.7	24.7
Actuated g/C Ratio	0.09	0.56		0.01	0.48		0.05	0.05		0.12	0.12	0.27
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	293	1897		19	1599		82	80		197	199	430
v/s Ratio Prot	c0.04	c0.22		0.00	c0.24		c0.01	0.00		0.06	c0.06	0.02
v/s Ratio Perm												
v/c Ratio	0.41	0.40		0.26	0.51		0.18	0.09		0.52	0.52	0.07
Uniform Delay, d1	38.8	11.4		44.1	16.1		41.3	41.2		37.2	37.3	24.2
Progression Factor	1.00	1.00		1.52	0.60		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	0.1		6.9	1.1		1.1	0.5		2.3	2.5	0.1
Delay (s)	39.7	11.5		73.9	10.8		42.4	41.7		39.5	39.7	24.2
Level of Service	D	B		E	B		D	D		D	D	C
Approach Delay (s)		15.3			11.2			42.1			34.2	
Approach LOS		B			B			D			C	

Intersection Summary

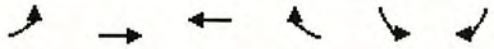
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Tsienneto Rd & NH 28 Byp S/NH 28 Byp N

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	100	220	20	25	210	255	120	100	80	80	270	90
Future Volume (vph)	100	220	20	25	210	255	120	100	80	80	270	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1822		1736	1827	1553	1770	1738		1787	1811	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1822		1736	1827	1553	1770	1738		1787	1811	
Peak-hour factor, PHF	0.82	0.82	0.82	0.81	0.81	0.81	0.68	0.68	0.68	0.78	0.78	0.78
Adj. Flow (vph)	122	268	24	31	259	315	176	147	118	103	346	115
RTOR Reduction (vph)	0	4	0	0	0	121	0	34	0	0	15	0
Lane Group Flow (vph)	122	288	0	31	259	194	176	231	0	103	447	0
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	8.0	21.8		3.2	17.0	32.0	9.0	23.4		7.6	22.0	
Effective Green, g (s)	8.0	21.8		3.2	17.0	32.0	9.0	23.4		7.6	22.0	
Actuated g/C Ratio	0.10	0.27		0.04	0.21	0.40	0.11	0.29		0.09	0.28	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	175	496		69	388	621	199	508		169	498	
v/s Ratio Prot	c0.07	c0.16		0.02	c0.14	0.12	c0.10	0.13		0.06	c0.25	
v/s Ratio Perm												
v/c Ratio	0.70	0.58		0.45	0.67	0.31	0.88	0.45		0.61	0.90	
Uniform Delay, d1	34.8	25.2		37.5	28.9	16.5	35.0	23.1		34.8	27.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.4	1.7		4.6	8.8	0.3	33.9	0.6		6.1	18.5	
Delay (s)	46.3	26.9		42.1	37.7	16.7	68.9	23.7		40.9	46.4	
Level of Service	D	C		D	D	B	E	C		D	D	
Approach Delay (s)		32.6			27.0			41.7			45.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱
Traffic Volume (vph)	0	935	850	0	280	645
Future Volume (vph)	0	935	850	0	280	645
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3574	3574		1752	1568
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3574	3574		1752	1568
Peak-hour factor, PHF	0.92	0.92	0.89	0.89	0.92	0.92
Adj. Flow (vph)	0	1016	955	0	304	701
RTOR Reduction (vph)	0	0	0	0	0	258
Lane Group Flow (vph)	0	1016	955	0	304	443
Heavy Vehicles (%)	1%	1%	1%	1%	3%	3%
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	2		7	
Permitted Phases						7
Actuated Green, G (s)		78.0	78.0		30.0	30.0
Effective Green, g (s)		78.0	78.0		30.0	30.0
Actuated g/C Ratio		0.65	0.65		0.25	0.25
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2323	2323		438	392
v/s Ratio Prot		c0.28	0.27		0.17	
v/s Ratio Perm						c0.28
v/c Ratio		0.44	0.41		0.69	1.13
Uniform Delay, d1		10.3	10.0		40.8	45.0
Progression Factor		1.00	0.13		1.00	1.00
Incremental Delay, d2		0.6	0.5		8.8	85.8
Delay (s)		10.9	1.8		49.6	130.8
Level of Service		B	A		D	F
Approach Delay (s)		10.9	1.8		106.2	
Approach LOS		B	A		F	

Intersection Summary			
HCM 2000 Control Delay	40.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	580	0	605	0	0	475	740	0	0	485	0
Future Volume (vph)	580	0	605	0	0	475	740	0	0	485	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.0			4.5	6.0			6.0	
Lane Util. Factor	0.97		1.00			1.00	0.95			0.95	
Frt	1.00		0.85			1.00	1.00			1.00	
Flt Protected	0.95		1.00			0.95	1.00			1.00	
Satd. Flow (prot)	3467		1599			1770	3539			3539	
Flt Permitted	0.95		1.00			0.95	1.00			1.00	
Satd. Flow (perm)	3467		1599			1770	3539			3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96	0.87	0.87	0.87
Adj. Flow (vph)	630	0	658	0	0	495	771	0	0	557	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	630	0	658	0	0	495	771	0	0	557	0
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot		Free			Prot	NA			NA	Free
Protected Phases	2					7	4			8	
Permitted Phases			Free				7				Free
Actuated Green, G (s)	43.4		120.0			36.7	66.1			24.9	
Effective Green, g (s)	43.4		120.0			36.7	66.1			24.9	
Actuated g/C Ratio	0.36		1.00			0.31	0.55			0.21	
Clearance Time (s)	4.5					4.5	6.0			6.0	
Vehicle Extension (s)	3.0					3.0	3.0			3.0	
Lane Grp Cap (vph)	1253		1599			541	1949			734	
v/s Ratio Prot	c0.18					c0.28	0.22			c0.16	
v/s Ratio Perm			0.41								
v/c Ratio	0.50		0.41			0.91	0.40			0.76	
Uniform Delay, d1	29.9		0.0			40.1	15.5			44.7	
Progression Factor	1.00		1.00			1.04	1.26			1.00	
Incremental Delay, d2	1.4		0.8			18.3	0.1			4.5	
Delay (s)	31.3		0.8			60.2	19.7			49.2	
Level of Service	C		A			E	B			D	
Approach Delay (s)		15.7		0.0			35.5			49.2	
Approach LOS		B		A			D			D	

Intersection Summary			
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	650	280	135	490	0	0	0	0	645	0	265
Future Volume (vph)	0	650	280	135	490	0	0	0	0	645	0	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3471	1553	1719	3438					3367		1553
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3471	1553	1719	3438					3367		1553
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	0	747	322	157	570	0	0	0	0	709	0	291
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	197
Lane Group Flow (vph)	0	747	322	157	570	0	0	0	0	709	0	94
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free		1							
Actuated Green, G (s)		38.5	100.0	14.7	59.2					28.8		28.8
Effective Green, g (s)		38.5	100.0	14.7	59.2					28.8		28.8
Actuated g/C Ratio		0.38	1.00	0.15	0.59					0.29		0.29
Clearance Time (s)		6.0		6.0	6.0					6.0		6.0
Vehicle Extension (s)		4.0		4.0	4.0					4.0		4.0
Lane Grp Cap (vph)		1336	1553	252	2035					969		447
v/s Ratio Prot		c0.22		c0.09	0.17					c0.21		0.06
v/s Ratio Perm			0.21									
v/c Ratio		0.56	0.21	0.62	0.28					0.73		0.21
Uniform Delay, d1		24.1	0.0	40.0	10.0					32.1		27.0
Progression Factor		1.00	1.00	0.90	0.42					1.00		1.00
Incremental Delay, d2		1.7	0.3	4.9	0.1					3.1		0.3
Delay (s)		25.8	0.3	40.7	4.3					35.2		27.3
Level of Service		C	A	D	A					D		C
Approach Delay (s)		18.1			12.1			0.0			32.9	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	235	1060	0	0	425	535	220	0	240	0	0	0
Future Volume (vph)	235	1060	0	0	425	535	220	0	240	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1752	3505			3505	1568	1703		1524			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1752	3505			3505	1568	1703		1524			
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.67	0.67	0.67	0.92	0.92	0.92
Adj. Flow (vph)	255	1152	0	0	467	588	328	0	358	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	73	0	0	0
Lane Group Flow (vph)	255	1152	0	0	467	588	328	0	285	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	6%	6%	6%	2%	2%	2%
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		5 2				Free						
Actuated Green, G (s)	20.3	62.1			35.8	100.0	25.9		25.9			
Effective Green, g (s)	20.3	62.1			35.8	100.0	25.9		25.9			
Actuated g/C Ratio	0.20	0.62			0.36	1.00	0.26		0.26			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	4.0	4.0			4.0		4.0		4.0			
Lane Grp Cap (vph)	355	2176			1254	1568	441		394			
v/s Ratio Prot	c0.15	c0.33			0.13		c0.19		0.19			
v/s Ratio Perm						0.38						
v/c Ratio	0.72	0.53			0.37	0.38	0.74		0.72			
Uniform Delay, d1	37.2	10.7			23.8	0.0	34.0		33.8			
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00			
Incremental Delay, d2	7.3	0.3			0.8	0.7	7.1		6.9			
Delay (s)	44.4	11.0			24.6	0.7	41.1		40.7			
Level of Service	D	B			C	A	D		D			
Approach Delay (s)		17.1			11.3			40.9			0.0	
Approach LOS		B			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	15	50	5	230	0	100	0	760	150	15	415	0
Future Volume (vph)	15	50	5	230	0	100	0	760	150	15	415	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.96			0.98			1.00	
Flt Protected		0.99			0.97			1.00			1.00	
Satd. Flow (prot)		1843			1744			1821			1841	
Flt Permitted		0.90			0.74			1.00			0.62	
Satd. Flow (perm)		1681			1335			1821			1144	
Peak-hour factor, PHF	0.83	0.83	0.83	0.98	0.98	0.98	0.95	0.95	0.95	0.89	0.89	0.89
Adj. Flow (vph)	18	60	6	235	0	102	0	800	158	17	466	0
RTOR Reduction (vph)	0	4	0	0	40	0	0	12	0	0	0	0
Lane Group Flow (vph)	0	80	0	0	297	0	0	946	0	0	483	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		2			2			1			1	
Permitted Phases	2			2						1		
Actuated Green, G (s)		15.8			15.8			30.1			30.1	
Effective Green, g (s)		15.8			15.8			30.1			30.1	
Actuated g/C Ratio		0.27			0.27			0.52			0.52	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		458			364			946			594	
v/s Ratio Prot								c0.52				
v/s Ratio Perm		0.05			c0.22						0.42	
v/c Ratio		0.17			0.82			1.00			0.81	
Uniform Delay, d1		16.1			19.7			13.9			11.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			13.2			29.4			8.3	
Delay (s)		16.3			32.9			43.3			19.9	
Level of Service		B			C			D			B	
Approach Delay (s)		16.3			32.9			43.3			19.9	
Approach LOS		B			C			D			B	

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	57.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	70	295	35	135	340	150	135	410	40	75	250	65
Future Volume (vph)	70	295	35	135	340	150	135	410	40	75	250	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1816		1752	1845	1568	1787	1856		1787	1823	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1816		1752	1845	1568	1787	1856		1787	1823	
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95	0.94	0.94	0.94
Adj. Flow (vph)	77	324	38	145	366	161	142	432	42	80	266	69
RTOR Reduction (vph)	0	5	0	0	0	101	0	4	0	0	11	0
Lane Group Flow (vph)	77	357	0	145	366	60	142	470	0	80	324	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4	5	5	2		1	6	
Permitted Phases						4						
Actuated Green, G (s)	7.7	20.8		8.9	22.0	31.7	9.7	27.0		4.3	21.6	
Effective Green, g (s)	7.7	20.8		8.9	22.0	31.7	9.7	27.0		4.3	21.6	
Actuated g/C Ratio	0.09	0.24		0.10	0.26	0.37	0.11	0.32		0.05	0.25	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	158	444		183	477	695	203	589		90	463	
v/s Ratio Prot	0.04	0.20		c0.08	c0.20	0.01	c0.08	c0.25		0.04	0.18	
v/s Ratio Perm						0.03						
v/c Ratio	0.49	0.80		0.79	0.77	0.09	0.70	0.80		0.89	0.70	
Uniform Delay, d1	36.8	30.2		37.1	29.1	17.3	36.2	26.5		40.1	28.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	10.1		20.5	7.3	0.1	10.1	10.8		59.2	4.6	
Delay (s)	39.1	40.3		57.6	36.4	17.3	46.3	37.3		99.3	33.3	
Level of Service	D	D		E	D	B	D	D		F	C	
Approach Delay (s)		40.1			36.4			39.4			46.1	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	39.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	80	360	150	520	430	190	240	320	90	150	220	380
Future Volume (vph)	80	360	150	520	430	190	240	320	90	150	220	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	1863	1583	1770	1863	1583	1787	1881	1599
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	1863	1583	1770	1863	1583	1787	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.96	0.96	0.96	0.95	0.95	0.95
Adj. Flow (vph)	87	391	163	553	457	202	250	333	94	158	232	400
RTOR Reduction (vph)	0	0	121	0	0	125	0	0	71	0	0	89
Lane Group Flow (vph)	87	391	42	553	457	77	250	333	23	158	232	311
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6		7	4		3	8	1
Permitted Phases			2			6			4			8
Actuated Green, G (s)	9.8	29.4	29.4	24.3	43.9	43.9	18.4	28.3	28.3	9.0	18.9	43.2
Effective Green, g (s)	9.8	29.4	29.4	24.3	43.9	43.9	18.4	28.3	28.3	9.0	18.9	43.2
Actuated g/C Ratio	0.09	0.26	0.26	0.21	0.38	0.38	0.16	0.25	0.25	0.08	0.16	0.38
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	150	904	404	725	711	604	283	458	389	139	309	684
v/s Ratio Prot	0.05	0.11		c0.16	c0.25		c0.14	c0.18		0.09	0.12	0.10
v/s Ratio Perm			0.03			0.05			0.01			0.10
v/c Ratio	0.58	0.43	0.10	0.76	0.64	0.13	0.88	0.73	0.06	1.14	0.75	0.46
Uniform Delay, d1	50.6	35.8	32.7	42.6	29.1	23.1	47.3	39.8	33.2	53.0	45.8	27.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.4	1.5	0.5	4.8	2.0	0.1	26.0	5.7	0.1	117.8	9.8	0.5
Delay (s)	56.0	37.3	33.2	47.4	31.1	23.2	73.3	45.5	33.2	170.8	55.6	27.5
Level of Service	E	D	C	D	C	C	E	D	C	F	E	C
Approach Delay (s)		38.8			37.2			54.0			64.4	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	47.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	170	1400	5	20	855	80	15	10	15	45	10	215
Future Volume (vph)	170	1400	5	20	855	80	15	10	15	45	10	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.96	1.00
Satd. Flow (prot)	1787	3572		1787	3528			1844	1615		1808	1599
Flt Permitted	0.95	1.00		0.95	1.00			0.77	1.00		0.75	1.00
Satd. Flow (perm)	1787	3572		1787	3528			1471	1615		1405	1599
Peak-hour factor, PHF	0.97	0.97	0.97	0.95	0.95	0.95	0.90	0.90	0.90	0.80	0.80	0.80
Adj. Flow (vph)	175	1443	5	21	900	84	17	11	17	56	12	269
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	15	0	0	240
Lane Group Flow (vph)	175	1448	0	21	978	0	0	28	2	0	69	29
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4	4	4
Actuated Green, G (s)	14.5	64.4		2.5	52.4			10.1	10.1		10.1	10.1
Effective Green, g (s)	14.5	64.4		2.5	52.4			10.1	10.1		10.1	10.1
Actuated g/C Ratio	0.15	0.68		0.03	0.55			0.11	0.11		0.11	0.11
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	272	2421		47	1945			156	171		149	169
v/s Ratio Prot	c0.10	c0.41		0.01	0.28							
v/s Ratio Perm								0.02	0.00		c0.05	0.02
v/c Ratio	0.64	0.60		0.45	0.50			0.18	0.01		0.46	0.17
Uniform Delay, d1	37.8	8.3		45.6	13.2			38.7	38.0		39.9	38.6
Progression Factor	0.77	1.64		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	4.0	0.8		6.6	0.9			0.6	0.0		2.3	0.5
Delay (s)	33.3	14.5		52.2	14.2			39.2	38.0		42.2	39.1
Level of Service	C	B		D	B			D	D		D	D
Approach Delay (s)		16.5			14.9			38.8			39.7	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
9: VIP Dr/Ashleigh Dr & NH 28

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	1095	5	5	800	260	40	10	10	345	5	135
Future Volume (vph)	110	1095	5	5	800	260	40	10	10	345	5	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00		1.00	0.96		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	3467	3572		1770	3409		1805	1758		1715	1721	1615
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.95	1.00
Satd. Flow (perm)	3467	3572		1770	3409		1805	1758		1715	1721	1615
Peak-hour factor, PHF	0.84	0.84	0.84	0.90	0.90	0.90	0.78	0.78	0.78	0.86	0.86	0.86
Adj. Flow (vph)	131	1304	6	6	889	289	51	13	13	401	6	157
RTOR Reduction (vph)	0	0	0	0	32	0	0	12	0	0	0	77
Lane Group Flow (vph)	131	1310	0	6	1146	0	51	14	0	205	202	80
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases		2			6							
Actuated Green, G (s)	7.7	52.5		1.0	45.8		4.0	4.0		13.5	13.5	27.2
Effective Green, g (s)	7.7	52.5		1.0	45.8		4.0	4.0		13.5	13.5	27.2
Actuated g/C Ratio	0.08	0.55		0.01	0.48		0.04	0.04		0.14	0.14	0.29
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	281	1974		18	1643		76	74		243	244	462
v/s Ratio Prot	c0.04	c0.37		0.00	0.34		c0.03	0.01		c0.12	0.12	0.05
v/s Ratio Perm												
v/c Ratio	0.47	0.66		0.33	0.70		0.67	0.18		0.84	0.83	0.17
Uniform Delay, d1	41.7	15.0		46.7	19.2		44.9	43.9		39.7	39.6	25.5
Progression Factor	1.00	1.00		1.48	0.69		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.2	1.8		9.3	1.1		20.8	1.2		22.5	20.1	0.2
Delay (s)	42.9	16.8		78.4	14.4		65.7	45.1		62.2	59.7	25.6
Level of Service	D	B		E	B		E	D		E	E	C
Approach Delay (s)		19.2			14.7			58.7			51.1	
Approach LOS		B			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

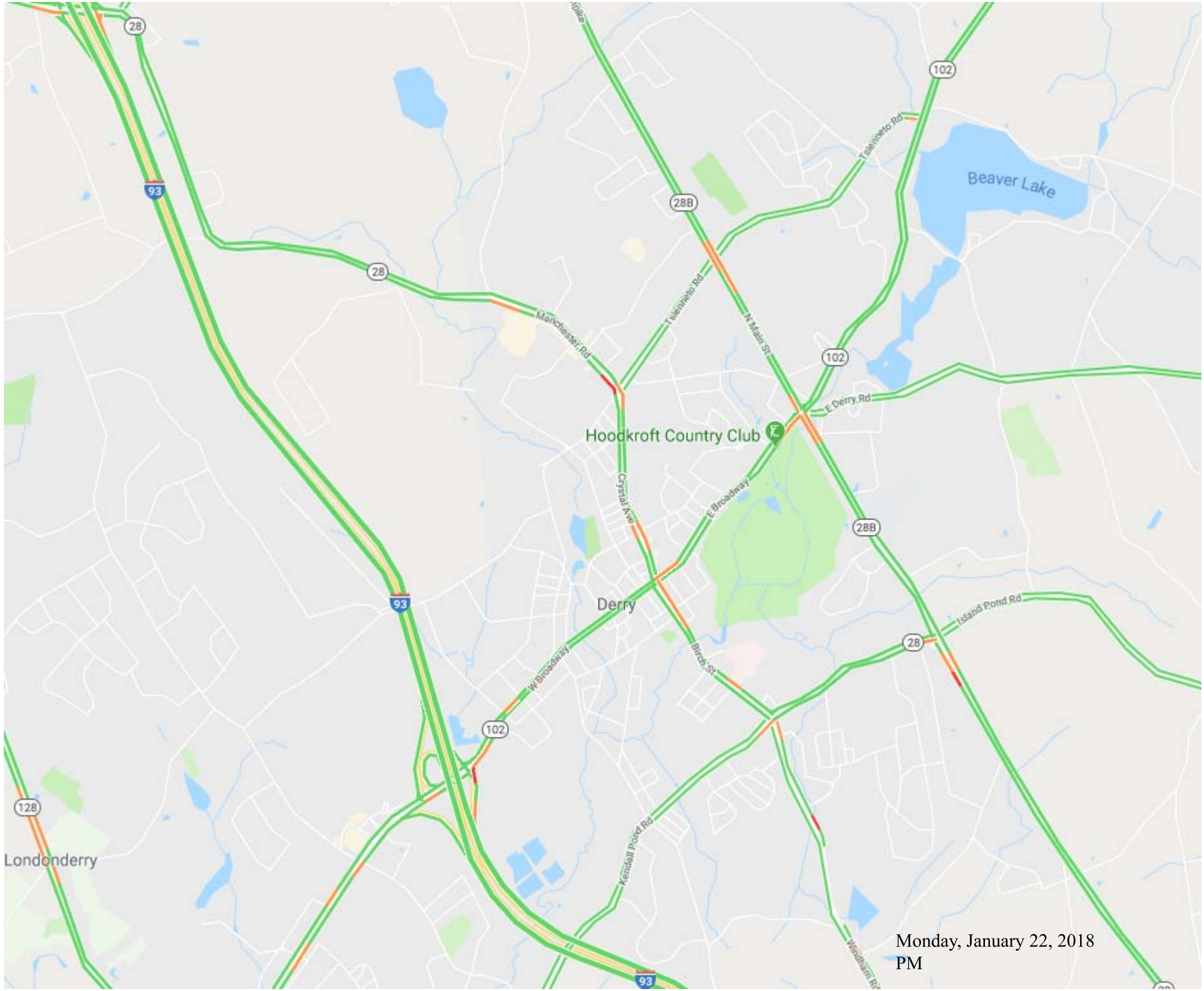
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Tsienneto Rd & NH 28 Byp NB/NH 28 Byp SB

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	100	320	25	75	185	185	280	345	75	25	175	70
Future Volume (vph)	100	320	25	75	185	185	280	345	75	25	175	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1843		1787	1881	1599	1805	1849		1805	1819	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1843		1787	1881	1599	1805	1849		1805	1819	
Peak-hour factor, PHF	0.99	0.99	0.99	0.95	0.95	0.95	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	101	323	25	79	195	195	315	388	84	27	188	75
RTOR Reduction (vph)	0	3	0	0	0	101	0	8	0	0	17	0
Lane Group Flow (vph)	101	345	0	79	195	94	315	464	0	27	246	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases		6			2							
Actuated Green, G (s)	7.1	17.0		6.4	16.3	38.6	16.3	29.4		3.2	16.3	
Effective Green, g (s)	7.1	17.0		6.4	16.3	38.6	16.3	29.4		3.2	16.3	
Actuated g/C Ratio	0.09	0.21		0.08	0.20	0.48	0.20	0.37		0.04	0.20	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	157	391		142	383	771	367	679		72	370	
v/s Ratio Prot	c0.06	c0.19		0.04	0.10	0.06	c0.17	c0.25		0.01	0.14	
v/s Ratio Perm												
v/c Ratio	0.64	0.88		0.56	0.51	0.12	0.86	0.68		0.38	0.67	
Uniform Delay, d1	35.2	30.5		35.4	28.3	11.4	30.7	21.4		37.4	29.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.7	20.2		4.7	4.8	0.1	17.7	2.8		3.3	4.5	
Delay (s)	43.9	50.7		40.1	33.1	11.5	48.4	24.2		40.7	33.8	
Level of Service	D	D		D	C	B	D	C		D	C	
Approach Delay (s)		49.2			25.3			33.9			34.5	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX H: GOOGLE MAPS PRINTOUT OF TRAFFIC CONDITIONS – DERRY AREA – JANUARY 2018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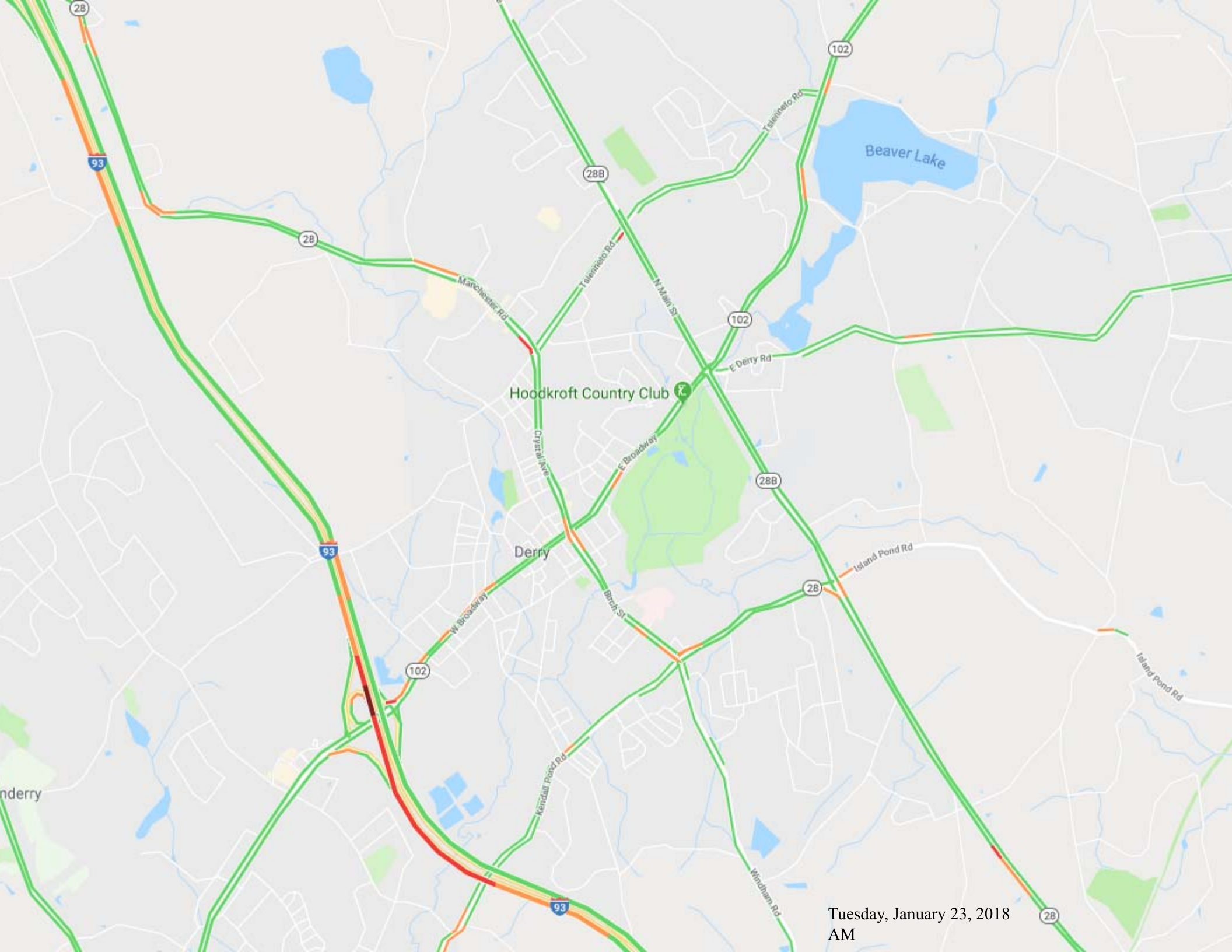
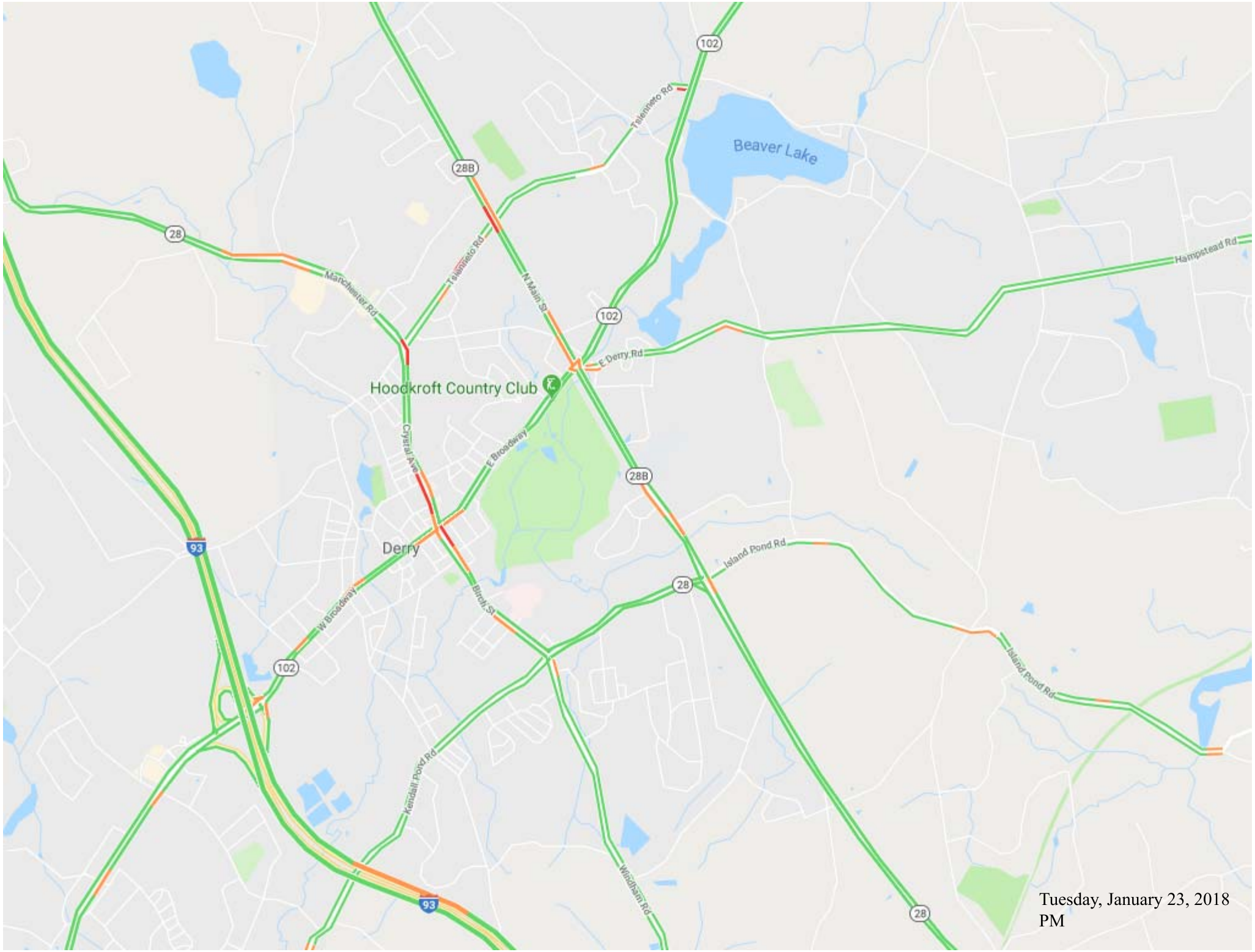
93
28
Manchester Rd
Talleneto Rd
28B
102
Beaver Lake
Talleneto Rd
N Main St
102
E Derry Rd
Hoodkroft Country Club
Crystal Ave
E Broadway
28B
Derry
Island Pond Rd
28
W Broadway
Birch St
102
128
Londonderry
Kendall Pond Rd
93
93
Monday, January 22, 2018
PM



Tuesday, January 23, 2018
AM



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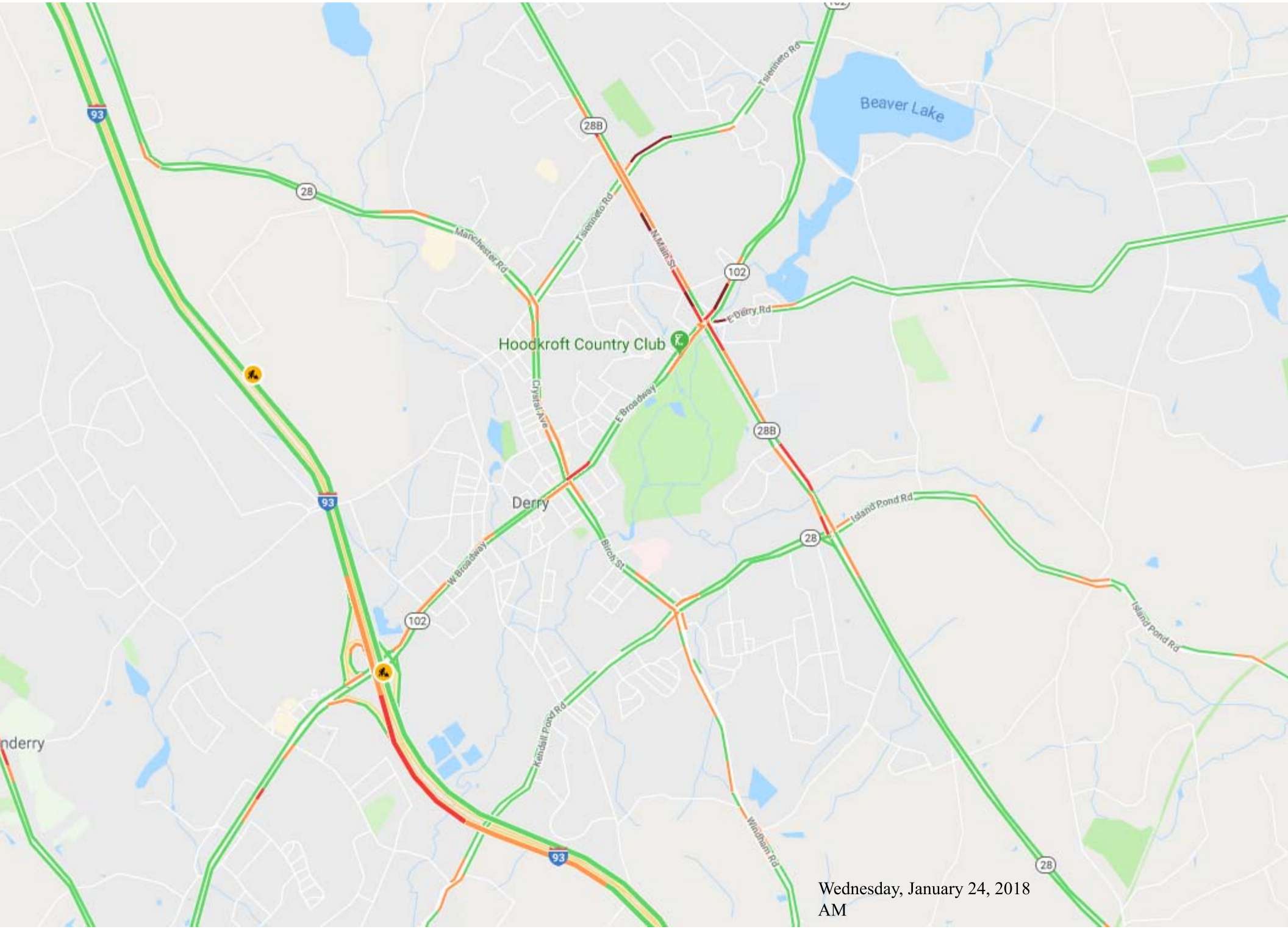
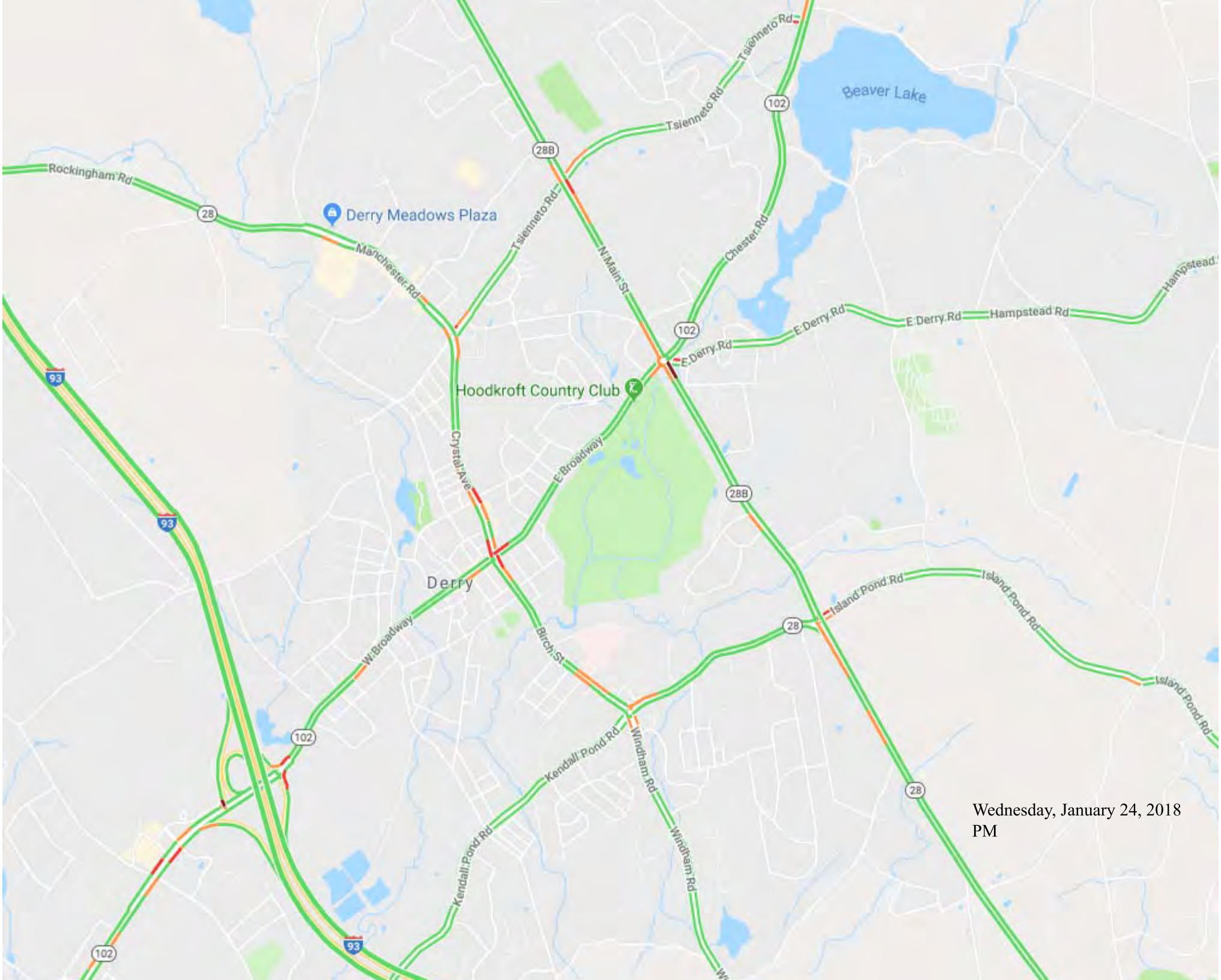
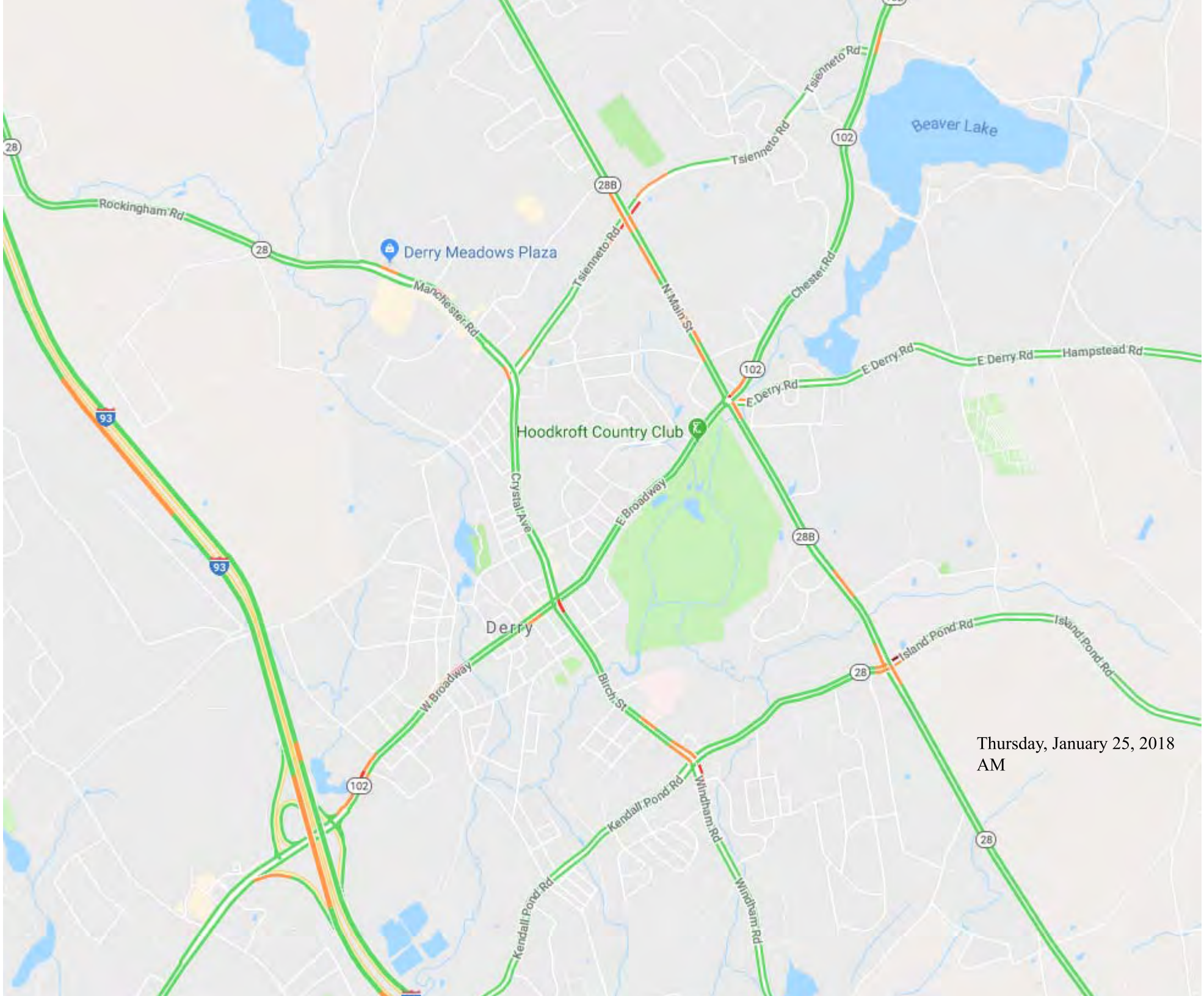


Wednesday, January 24, 2018
AM


Beaver Lake
Tsienneto Rd
Rockingham Rd
28
Derry Meadows Plaza
Manchester Rd
28B
N Main St
Chester Rd
102
E Derry Rd
Hampstead Rd
93
Hoodkroft Country Club
Crystal Ave
E Broadway
Derry
W Broadway
Birch St
Island Pond Rd
Kendall Pond Rd
Windham Rd
Wednesday, January 24, 2018
PM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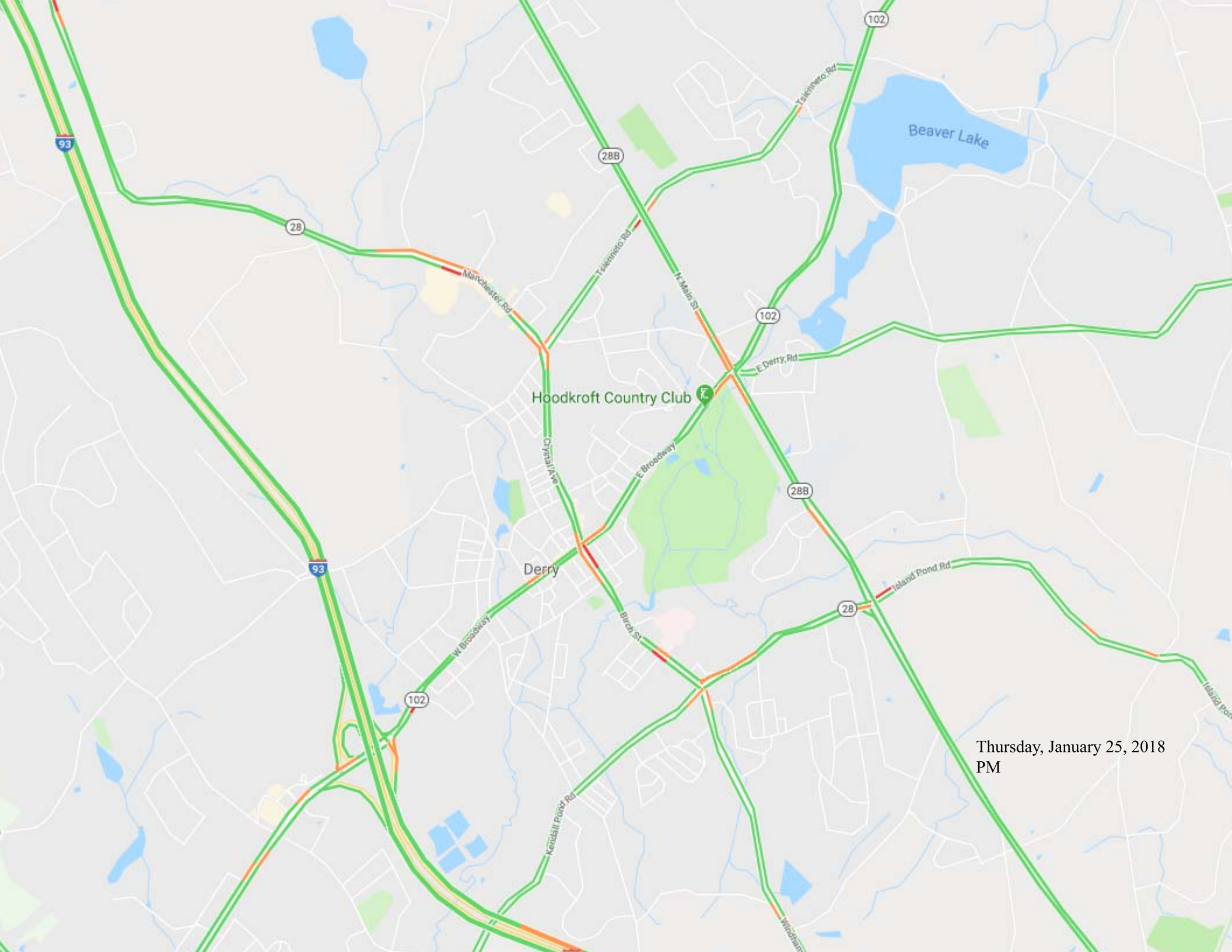
Tsienneto Rd
Rockingham Rd
Derry Meadows Plaza
Manchester Rd
N Main St
Chester Rd
E Derry Rd
Hampstead Rd
Hoodkroft Country Club
Crystal Ave
E Broadway
Derry
W Broadway
Birch St
Island Pond Rd
Kendall Pond Rd
Windham Rd
Thursday, January 25, 2018
AM



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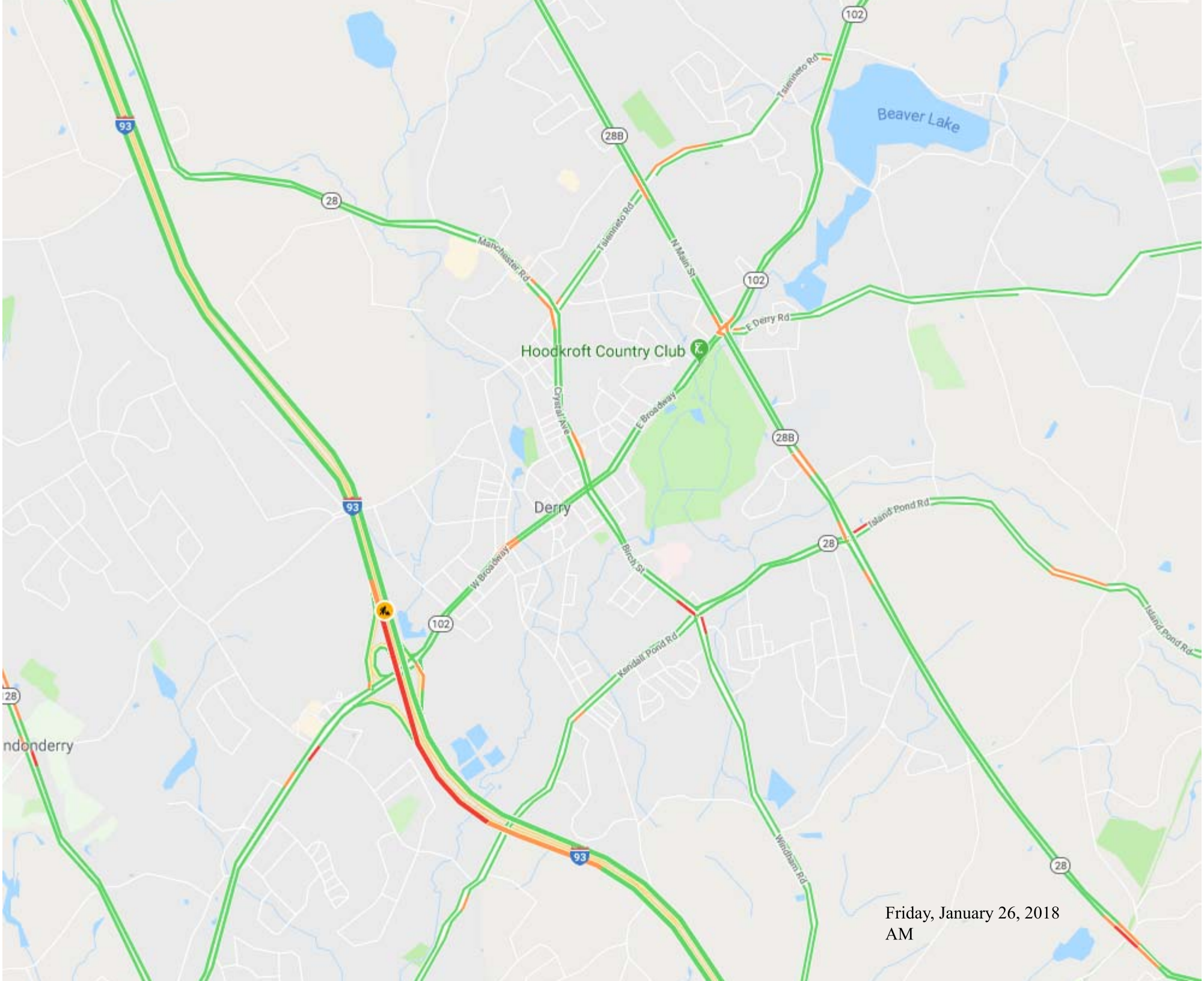
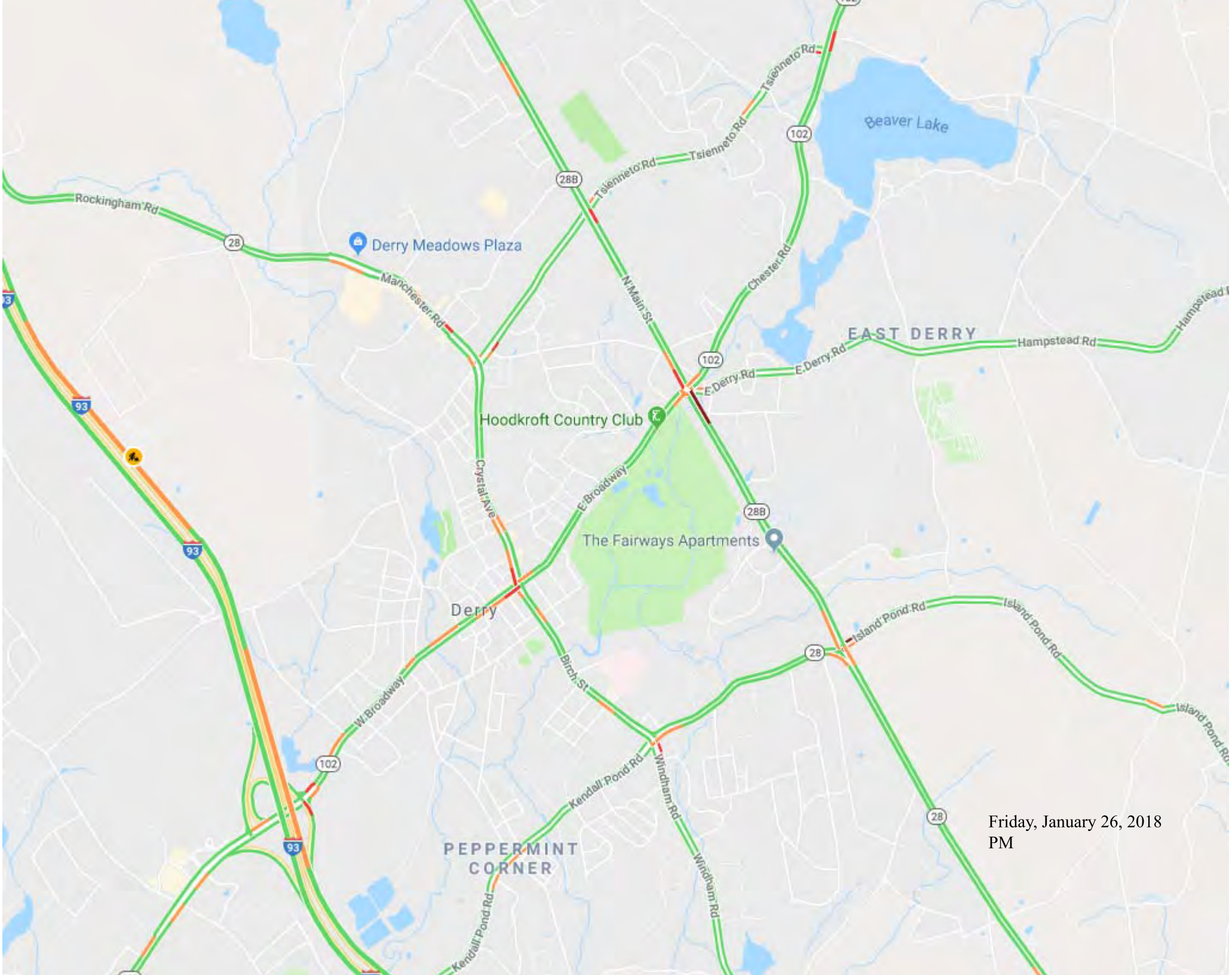

Beaver Lake
Hoodkroft Country Club
Derry
Manchester Rd
Tsienneto Rd
N Main St
E Derry Rd
Crystal Ave
E Broadway
W Broadway
Birch St
Kendall Pond Rd
Island Pond Rd
Windham Rd
93
28
28B
102
ndonderry
Friday, January 26, 2018
AM


Beaver Lake
Tsienneto Rd
Tsienneto Rd
Tsienneto Rd
102
28B
Rockingham Rd
28
Derry Meadows Plaza
Manchester Rd
N Main St
Chester Rd
EAST DERRY
Hampstead Rd
E Derry Rd
E Derry Rd
102
Hoodkroft Country Club
93
Crystal Ave
E Broadway
28B
The Fairways Apartments
93
Derry
Island Pond Rd
Island Pond Rd
28
Island Pond Rd
W Broadway
Birch St
102
Kendall Pond Rd
Windham Rd
PEPPERMINT CORNER
Kendall Pond Rd
Windham Rd
28
Friday, January 26, 2018
PM

APPENDIX I: HCM PRINTOUTS – UNSIGNALIZED INTERSECTION CAPACITY ANALYSES – 2015 AM AND PM PEAK HCM PRINTOUTS

Intersection													
Int Delay, s/veh	3.2												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕	↱		↕		↰	↑			↕	
Traffic Vol, veh/h	10	0	105	0	0	1	75	520	5	5	1090	25
Future Vol, veh/h	10	0	105	0	0	1	75	520	5	5	1090	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	25	25	25	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	0	0	0	2	2	2	2	2	2
Mvmt Flow	11	0	114	0	0	4	82	565	5	5	1185	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1942	1943	1198	1940	1954	568	1212	0	0	571	0	0
Stage 1	1209	1209	-	731	731	-	-	-	-	-	-	-
Stage 2	733	734	-	1209	1223	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	49	65	226	50	65	526	576	-	-	1002	-	-
Stage 1	223	256	-	416	430	-	-	-	-	-	-	-
Stage 2	412	426	-	225	254	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	43	55	226	22	55	526	576	-	-	1002	-	-
Mov Cap-2 Maneuver	43	55	-	22	55	-	-	-	-	-	-	-
Stage 1	191	252	-	357	369	-	-	-	-	-	-	-
Stage 2	351	365	-	110	250	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	43	11.9	1.5	0
HCM LOS	E	B		

EB NB SB WB

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SELn2	SWL	SWT	SWR
Capacity (veh/h)	576	-	-	526	43	226	1002	-	-
HCM Lane V/C Ratio	0.142	-	-	0.008	0.253	0.505	0.005	-	-
HCM Control Delay (s)	12.3	-	-	11.9	115	36.1	8.6	0	-
HCM Lane LOS	B	-	-	B	F	E	A	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0	0.8	2.6	0	-	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	180	10	5	125	175	230
Future Vol, veh/h	180	10	5	125	175	230
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	91	91	93	93
Heavy Vehicles, %	5	5	4	4	2	2
Mvmt Flow	202	11	5	137	188	247

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	460	312	435	0	-	0
Stage 1	312	-	-	-	-	-
Stage 2	148	-	-	-	-	-
Critical Hdwy	6.45	6.25	4.14	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	2.236	-	-	-
Pot Cap-1 Maneuver	554	721	1114	-	-	-
Stage 1	735	-	-	-	-	-
Stage 2	872	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	551	721	1114	-	-	-
Mov Cap-2 Maneuver	551	-	-	-	-	-
Stage 1	735	-	-	-	-	-
Stage 2	868	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.4	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1114	-	558	-	-
HCM Lane V/C Ratio	0.005	-	0.383	-	-
HCM Control Delay (s)	8.2	0	15.4	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	1.8	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	0	0	310	400	20
Future Vol, veh/h	10	0	0	310	400	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	44	44	95	95	96	96
Heavy Vehicles, %	79	79	4	4	6	6
Mvmt Flow	23	0	0	326	417	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	753	427	438	0	-	0
Stage 1	427	-	-	-	-	-
Stage 2	326	-	-	-	-	-
Critical Hdwy	7.19	6.99	4.14	-	-	-
Critical Hdwy Stg 1	6.19	-	-	-	-	-
Critical Hdwy Stg 2	6.19	-	-	-	-	-
Follow-up Hdwy	4.211	4.011	2.236	-	-	-
Pot Cap-1 Maneuver	286	492	1111	-	-	-
Stage 1	521	-	-	-	-	-
Stage 2	587	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	286	492	1111	-	-	-
Mov Cap-2 Maneuver	286	-	-	-	-	-
Stage 1	521	-	-	-	-	-
Stage 2	587	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1111	-	286	-	-
HCM Lane V/C Ratio	-	-	0.079	-	-
HCM Control Delay (s)	0	-	18.7	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↱			↕			↕			↕	
Traffic Vol, veh/h	35	270	5	30	385	10	10	5	30	10	5	35
Future Vol, veh/h	35	270	5	30	385	10	10	5	30	10	5	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	96	96	96	65	65	65	67	67	67
Heavy Vehicles, %	7	7	7	5	5	5	2	2	2	0	0	0
Mvmt Flow	39	303	6	31	401	10	15	8	46	15	7	52

Major/Minor	Major1			Major2			Minor2			Minor1		
Conflicting Flow All	411	0	0	309	0	0	884	857	406	858	859	306
Stage 1	-	-	-	-	-	-	469	469	-	385	385	-
Stage 2	-	-	-	-	-	-	415	388	-	473	474	-
Critical Hdwy	4.17	-	-	4.15	-	-	7.12	6.52	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Follow-up Hdwy	2.263	-	-	2.245	-	-	3.518	4.018	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	1121	-	-	1235	-	-	266	295	645	279	296	739
Stage 1	-	-	-	-	-	-	575	561	-	642	614	-
Stage 2	-	-	-	-	-	-	615	609	-	576	561	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1121	-	-	1235	-	-	228	273	645	239	274	739
Mov Cap-2 Maneuver	-	-	-	-	-	-	228	273	-	239	274	-
Stage 1	-	-	-	-	-	-	551	542	-	615	588	-
Stage 2	-	-	-	-	-	-	541	583	-	510	542	-

Approach	EB	WB	SE	NW
HCM Control Delay, s	0.9	0.6	10.5	14.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	WBL	WBT	WBR	SELn1
Capacity (veh/h)	465	1121	-	-	1235	-	-	724
HCM Lane V/C Ratio	0.16	0.035	-	-	0.025	-	-	0.096
HCM Control Delay (s)	14.2	8.3	-	-	8	0	-	10.5
HCM Lane LOS	B	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0.1	-	-	0.1	-	-	0.3

12

Intersection	
Int Delay, s/veh	22.6

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	215	80	370	245	80	570
Future Vol, veh/h	215	80	370	245	80	570
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	150	-	0	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	83	83	86	86	81	81
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	259	96	430	285	99	704

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	979	430	0	0	430	0
Stage 1	430	-	-	-	-	-
Stage 2	549	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	262	624	-	-	1128	-
Stage 1	655	-	-	-	-	-
Stage 2	543	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 224	624	-	-	1128	-
Mov Cap-2 Maneuver	~ 224	-	-	-	-	-
Stage 1	655	-	-	-	-	-
Stage 2	465	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	115.7	0	1.5
HCM LOS	F		

Minor Lane/Major Mvmt	NET	NER	NWLn1	NWLn2	SWL	SWT
Capacity (veh/h)	-	-	224	624	1128	-
HCM Lane V/C Ratio	-	-	1.156	0.154	0.088	-
HCM Control Delay (s)	-	-	154.3	11.8	8.5	0.5
HCM Lane LOS	-	-	F	B	A	A
HCM 95th %tile Q(veh)	-	-	12.3	0.5	0.3	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	11.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	720	645	40	80	35
Future Vol, veh/h	15	720	645	40	80	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	89	89	83	83
Heavy Vehicles, %	7	7	4	4	6	6
Mvmt Flow	18	857	725	45	96	42

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	770	0	-	0	1640	747
Stage 1	-	-	-	-	747	-
Stage 2	-	-	-	-	893	-
Critical Hdwy	4.17	-	-	-	6.46	6.26
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.263	-	-	-	3.554	3.354
Pot Cap-1 Maneuver	823	-	-	-	108	406
Stage 1	-	-	-	-	461	-
Stage 2	-	-	-	-	393	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	823	-	-	-	106	406
Mov Cap-2 Maneuver	-	-	-	-	106	-
Stage 1	-	-	-	-	461	-
Stage 2	-	-	-	-	384	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	143.2
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	823	-	-	-	137
HCM Lane V/C Ratio	0.022	-	-	-	1.011
HCM Control Delay (s)	9.5	-	-	-	143.2
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	7.3

Intersection						
Intersection Delay, s/veh	76.6					
Intersection LOS	F	27R	Byp 28	Byp 28	102 EB	102 WB
Approach		**WB**	**NB**	**SB**	**NE**	**SW**
Entry Lanes		1	1	1	1	1
Conflicting Circle Lanes		1	1	1	1	1
Adj Approach Flow, veh/h		516	436	557	617	397
Demand Flow Rate, veh/h		530	450	595	666	424
Vehicles Circulating, veh/h		788	673	698	629	1006
Vehicles Exiting, veh/h		335	622	732	665	312
Follow-Up Headway, s		3.186	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h		0	0	0	0	0
Ped Cap Adj		1.000	1.000	1.000	1.000	1.000
Approach Delay, s/veh		77.5	29.5	83.5	96.6	86.1
Approach LOS		F	D	F	F	F

Lane	Left	Left	Left	Left	Left
Designated Moves	LR	LTR	LTR	LTR	LTR
Assumed Moves	LR	LTR	LTR	LTR	LTR
RT Channelized					
Lane Util	1.000	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193	5.193
Entry Flow, veh/h	530	450	595	666	424
Cap Entry Lane, veh/h	514	576	562	602	413
Entry HV Adj Factor	0.973	0.970	0.936	0.926	0.935
Flow Entry, veh/h	516	436	557	617	396
Cap Entry, veh/h	500	559	526	558	386
V/C Ratio	1.031	0.781	1.058	1.106	1.026
Control Delay, s/veh	77.5	29.5	83.5	96.6	86.1
LOS	F	D	F	F	F
95th %tile Queue, veh	15	7	16	19	13

Intersection	
Int Delay, s/veh	61.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↕			↕			↕	
Traffic Vol, veh/h	10	15	185	5	40	50	245	390	5	10	255	45
Future Vol, veh/h	10	15	185	5	40	50	245	390	5	10	255	45
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	70	70	70	75	75	75	71	71	71
Heavy Vehicles, %	8	8	8	5	5	5	3	3	3	4	4	4
Mvmt Flow	12	18	226	7	57	71	327	520	7	14	359	63

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1660	1599	391	1605	1628	523	423	0	0	527	0	0
Stage 1	419	419	-	1177	1177	-	-	-	-	-	-	-
Stage 2	1241	1180	-	428	451	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.15	6.55	6.25	4.13	-	-	4.14	-	-
Critical Hdwy Stg 1	6.18	5.58	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.545	4.045	3.345	2.227	-	-	2.236	-	-
Pot Cap-1 Maneuver	75	103	645	83	100	548	1131	-	-	1030	-	-
Stage 1	600	580	-	230	261	-	-	-	-	-	-	-
Stage 2	208	257	-	599	566	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 4	60	645	28	58	548	1131	-	-	1030	-	-
Mov Cap-2 Maneuver	~ 4	60	-	28	58	-	-	-	-	-	-	-
Stage 1	355	570	-	136	154	-	-	-	-	-	-	-
Stage 2	67	152	-	370	556	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	237	296.3	3.6	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1131	-	-	9	645	99	1030	-	-
HCM Lane V/C Ratio	0.289	-	-	3.388	0.35	1.371	0.014	-	-
HCM Control Delay (s)	9.5	0	-	$ 1890	13.6	296.3	8.5	0	-
HCM Lane LOS	A	A	-	F	B	F	A	A	-
HCM 95th %tile Q(veh)	1.2	-	-	5	1.6	9.8	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	95	0	15	165	320	300
Future Vol, veh/h	95	0	15	165	320	300
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	91	91	82	82
Heavy Vehicles, %	2	2	11	11	2	2
Mvmt Flow	101	0	16	181	390	366

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	787	573	756	0	-	0
Stage 1	573	-	-	-	-	-
Stage 2	214	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.21	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.299	-	-	-
Pot Cap-1 Maneuver	360	519	816	-	-	-
Stage 1	564	-	-	-	-	-
Stage 2	822	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	352	519	816	-	-	-
Mov Cap-2 Maneuver	352	-	-	-	-	-
Stage 1	564	-	-	-	-	-
Stage 2	804	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.3	0.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	816	-	352	-	-
HCM Lane V/C Ratio	0.02	-	0.287	-	-
HCM Control Delay (s)	9.5	0	19.3	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.2	-	-

Intersection												
Int Delay, s/veh	11.5											
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↰	↱		↕		↰	↕			↕	
Traffic Vol, veh/h	10	5	130	5	0	5	285	950	120	5	720	35
Future Vol, veh/h	10	5	130	5	0	5	285	950	120	5	720	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	58	58	58	97	97	97	95	95	95
Heavy Vehicles, %	2	2	2	0	0	0	1	1	1	2	2	2
Mvmt Flow	12	6	157	9	0	9	294	979	124	5	758	37

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2420	2478	776	2419	2434	1041	795	0	0	1103	0	0
Stage 1	787	787	-	1629	1629	-	-	-	-	-	-	-
Stage 2	1633	1691	-	790	805	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.11	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.209	-	-	2.218	-	-
Pot Cap-1 Maneuver	22	30	397	23	32	282	831	-	-	633	-	-
Stage 1	385	403	-	130	162	-	-	-	-	-	-	-
Stage 2	128	149	-	386	398	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	15	19	397	~ 8	20	282	831	-	-	633	-	-
Mov Cap-2 Maneuver	15	19	-	~ 8	20	-	-	-	-	-	-	-
Stage 1	249	397	-	84	105	-	-	-	-	-	-	-
Stage 2	80	96	-	227	392	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	79.8	$ 578.2	2.5	0.1
HCM LOS	F	F		

EB NB SB WB

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SELn2	SWL	SWT	SWR
Capacity (veh/h)	831	-	-	16	16	397	633	-	-
HCM Lane V/C Ratio	0.354	-	-	1.078	1.13	0.395	0.008	-	-
HCM Control Delay (s)	11.7	-	-	$ 578.2	$ 598.6	19.9	10.7	0	-
HCM Lane LOS	B	-	-	F	F	C	B	A	-
HCM 95th %tile Q(veh)	1.6	-	-	2.6	2.7	1.8	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	44.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	420	5	5	290	170	265
Future Vol, veh/h	420	5	5	290	170	265
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	87	87	87	87
Heavy Vehicles, %	1	1	2	2	1	1
Mvmt Flow	467	6	6	333	195	305

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	693	348	500	0	-	0
Stage 1	348	-	-	-	-	-
Stage 2	345	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.12	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.218	-	-	-
Pot Cap-1 Maneuver	~ 411	697	1064	-	-	-
Stage 1	717	-	-	-	-	-
Stage 2	719	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 408	697	1064	-	-	-
Mov Cap-2 Maneuver	~ 408	-	-	-	-	-
Stage 1	717	-	-	-	-	-
Stage 2	714	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	123.5	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1064	-	410	-	-
HCM Lane V/C Ratio	0.005	-	1.152	-	-
HCM Control Delay (s)	8.4	0	123.5	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0	-	17.8	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	0	0	700	440	10
Future Vol, veh/h	10	0	0	700	440	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	93	93	86	86
Heavy Vehicles, %	6	6	1	1	1	1
Mvmt Flow	20	0	0	753	512	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1270	517	523	0	-	0
Stage 1	517	-	-	-	-	-
Stage 2	753	-	-	-	-	-
Critical Hdwy	6.46	6.26	4.11	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.354	2.209	-	-	-
Pot Cap-1 Maneuver	182	550	1049	-	-	-
Stage 1	590	-	-	-	-	-
Stage 2	458	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	182	550	1049	-	-	-
Mov Cap-2 Maneuver	182	-	-	-	-	-
Stage 1	590	-	-	-	-	-
Stage 2	458	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	27.2	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1049	-	182	-	-
HCM Lane V/C Ratio	-	-	0.11	-	-
HCM Control Delay (s)	0	-	27.2	-	-
HCM Lane LOS	A	-	D	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	45	665	5	30	375	20	20	10	70	5	10	50
Future Vol, veh/h	45	665	5	30	375	20	20	10	70	5	10	50
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	88	88	88	67	67	67	82	82	82
Heavy Vehicles, %	1	1	1	2	2	2	0	0	0	0	0	0
Mvmt Flow	48	707	5	34	426	23	30	15	104	6	12	61

Major/Minor	Major1			Major2			Minor2			Minor1		
Conflicting Flow All	449	0	0	713	0	0	1348	1315	438	1319	1323	710
Stage 1	-	-	-	-	-	-	506	506	-	806	806	-
Stage 2	-	-	-	-	-	-	842	809	-	513	517	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1117	-	-	887	-	-	129	159	623	135	158	437
Stage 1	-	-	-	-	-	-	552	543	-	379	398	-
Stage 2	-	-	-	-	-	-	362	396	-	548	537	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1117	-	-	887	-	-	94	140	623	94	139	437
Mov Cap-2 Maneuver	-	-	-	-	-	-	94	140	-	94	139	-
Stage 1	-	-	-	-	-	-	513	515	-	352	370	-
Stage 2	-	-	-	-	-	-	280	368	-	420	510	-

Approach	EB	WB	SE	NW
HCM Control Delay, s	0.5	0.7	22.5	23.7
HCM LOS			C	C

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	WBL	WBT	WBR	SELn1
Capacity (veh/h)	271	1117	-	-	887	-	-	352
HCM Lane V/C Ratio	0.293	0.043	-	-	0.038	-	-	0.424
HCM Control Delay (s)	23.7	8.4	0	-	9.2	0	-	22.5
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.2	0.1	-	-	0.1	-	-	2

Intersection	
Int Delay, s/veh	28.8

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations	↰	↱	↑	↱		↑↑
Traffic Vol, veh/h	180	120	580	410	115	570
Future Vol, veh/h	180	120	580	410	115	570
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	150	-	0	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	86	86	96	96	85	85
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	209	140	604	427	135	671

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1210	604	0	0	604	0
Stage 1	604	-	-	-	-	-
Stage 2	606	-	-	-	-	-
Critical Hdwy	6.615	6.215	-	-	4.115	-
Critical Hdwy Stg 1	5.415	-	-	-	-	-
Critical Hdwy Stg 2	5.815	-	-	-	-	-
Follow-up Hdwy	3.5095	3.3095	-	-	2.2095	-
Pot Cap-1 Maneuver	~ 189	500	-	-	978	-
Stage 1	547	-	-	-	-	-
Stage 2	510	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 147	500	-	-	978	-
Mov Cap-2 Maneuver	~ 147	-	-	-	-	-
Stage 1	547	-	-	-	-	-
Stage 2	398	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	175.4	0	2.1
HCM LOS	F		

Minor Lane/Major Mvmt	NET	NER	NWLn1	NWLn2	SWL	SWT
Capacity (veh/h)	-	-	147	500	978	-
HCM Lane V/C Ratio	-	-	1.424	0.279	0.138	-
HCM Control Delay (s)	-	-	282.3	15	9.3	0.7
HCM Lane LOS	-	-	F	C	A	A
HCM 95th %tile Q(veh)	-	-	13.6	1.1	0.5	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	37.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	1125	700	160	70	30
Future Vol, veh/h	40	1125	700	160	70	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	90	90	75	75
Heavy Vehicles, %	2	2	2	2	3	3
Mvmt Flow	44	1236	778	178	93	40

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	956	0	-	0	2191	867
Stage 1	-	-	-	-	867	-
Stage 2	-	-	-	-	1324	-
Critical Hdwy	4.12	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.218	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	719	-	-	-	~ 50	351
Stage 1	-	-	-	-	410	-
Stage 2	-	-	-	-	247	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	719	-	-	-	~ 47	351
Mov Cap-2 Maneuver	-	-	-	-	~ 47	-
Stage 1	-	-	-	-	410	-
Stage 2	-	-	-	-	232	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	$ 656.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	719	-	-	-	63
HCM Lane V/C Ratio	0.061	-	-	-	2.116
HCM Control Delay (s)	10.3	-	-	-	-$ 656.1
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0.2	-	-	-	12.7

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Intersection Delay, s/veh	153.6					
Intersection LOS	F	EDR	Byp 28	Byp 28	102 EB	102 WB

Approach	WB	NB	SB	NE	SW
Entry Lanes	1	1	1	1	1
Conflicting Circle Lanes	1	1	1	1	1
Adj Approach Flow, veh/h	544	489	804	688	264
Demand Flow Rate, veh/h	549	499	811	695	268
Vehicles Circulating, veh/h	828	1055	555	862	964
Vehicles Exiting, veh/h	726	502	677	504	413
Follow-Up Headway, s	3.186	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000	1.000
Approach Delay, s/veh	103.3	169.4	146.4	240.0	24.6
Approach LOS	F	F	F	F	C

Lane	Left	Left	Left	Left	Left
Designated Moves	LR	LTR	LTR	LTR	LTR
Assumed Moves	LR	LTR	LTR	LTR	LTR
RT Channelized					
Lane Util	1.000	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193	5.193
Entry Flow, veh/h	549	499	811	695	268
Cap Entry Lane, veh/h	494	393	649	477	431
Entry HV Adj Factor	0.991	0.980	0.991	0.990	0.983
Flow Entry, veh/h	544	489	803	688	263
Cap Entry, veh/h	489	385	643	473	424
V/C Ratio	1.112	1.268	1.250	1.456	0.622
Control Delay, s/veh	103.3	169.4	146.4	240.0	24.6
LOS	F	F	F	F	C
95th %tile Queue, veh	18	21	30	34	4

Intersection	
Int Delay, s/veh	12.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↕			↕			↕	
Traffic Vol, veh/h	10	40	435	5	30	20	200	435	10	25	290	15
Future Vol, veh/h	10	40	435	5	30	20	200	435	10	25	290	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	82	82	82	93	93	93	91	91	91
Heavy Vehicles, %	2	2	2	0	0	0	1	1	1	1	1	1
Mvmt Flow	11	45	494	6	37	24	215	468	11	27	319	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1316	1291	327	1308	1293	473	335	0	0	478	0	0
Stage 1	382	382	-	903	903	-	-	-	-	-	-	-
Stage 2	934	909	-	405	390	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	135	163	714	138	164	595	1230	-	-	1090	-	-
Stage 1	640	613	-	335	359	-	-	-	-	-	-	-
Stage 2	319	354	-	626	611	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	80	120	714	24	121	595	1230	-	-	1090	-	-
Mov Cap-2 Maneuver	80	120	-	24	121	-	-	-	-	-	-	-
Stage 1	488	594	-	255	274	-	-	-	-	-	-	-
Stage 2	202	270	-	172	592	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.6	76.5	2.6	0.6
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1230	-	-	109	714	112	1090	-	-
HCM Lane V/C Ratio	0.175	-	-	0.521	0.692	0.599	0.025	-	-
HCM Control Delay (s)	8.5	0	-	69.4	20.6	76.5	8.4	0	-
HCM Lane LOS	A	A	-	F	C	F	A	A	-
HCM 95th %tile Q(veh)	0.6	-	-	2.4	5.6	2.9	0.1	-	-

Intersection						
Int Delay, s/veh	15.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	270	5	15	360	235	190
Future Vol, veh/h	270	5	15	360	235	190
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	87	87	89	89
Heavy Vehicles, %	1	1	2	2	3	3
Mvmt Flow	300	6	17	414	264	213

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	819	371	478	0	-	0
Stage 1	371	-	-	-	-	-
Stage 2	448	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.12	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.218	-	-	-
Pot Cap-1 Maneuver	346	677	1084	-	-	-
Stage 1	700	-	-	-	-	-
Stage 2	646	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	339	677	1084	-	-	-
Mov Cap-2 Maneuver	339	-	-	-	-	-
Stage 1	700	-	-	-	-	-
Stage 2	633	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	60.9	0.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1084	-	342	-	-
HCM Lane V/C Ratio	0.016	-	0.893	-	-
HCM Control Delay (s)	8.4	0	60.9	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0	-	8.7	-	-

APPENDIX J: 2040 AWDT PEAK HOUR VOLUMES

11-Apr-17

rev 5-17-17

rev 9-14-17

TABLE I-1

Adjusted 2040 AAWDT and Peak Hour No-Build volumes based on 2015 counts

Annual Growth rates:
2014->2015 1.025
2015->2015 1.000
2016->2015 0.975

Seasonal: Use Urban Highway Group 4 adjustment factors
Intersection Turning Movement Counts

	Adj Factor=	AM Peak	PM Peak
April		0.96	0.99
May		0.96	0.98
June		0.96	0.94
July		1.04	0.96
Sept		0.95	0.97

	Count Location	Count Month/Yr	Raw AAWDT	Adj 2015 AAWDT	Counted AM Peak Volume	Adj 2015 AM Peak Volume	AM Pk as % of AAWDT	Counted PM Peak Volume	Adj 2015 PM Peak Volume	PM Pk as % of AAWDT	2015 AWDT Base Model Assigns	2040 AAWDT No-Build Assigns	% Growth 2015-40	(Apply % to 2015 adj AAWDT) 2040 NB AAWDT	2040 NoBd AM Pk	2040 NoBd PM Pk
Derry	Crystal Av (NH 28), S of Tsienneto	May-16	15,585	15,195	836	803	5.28%	1418	1390	9.15%	13,406	10,220	-23.77%	11,584	612	1060
	Folsom Rd W of NH 28	May-16	12,070	11,768	778	747	6.35%	1199	1175	9.98%	8,960	10,537	17.60%	13,839	878	1382
	Pinkerton St E of Tsienneto	May-16	10,722	10,454	695	667	6.38%	1017	997	9.54%	8,776	6,396	-27.12%	7,619	486	727
	Tsiennto Rd, W of NH 102	May-16	5,532	5,394	483	464	8.60%	511	501	9.29%	5,666	9,072	60.11%	8,636	743	802
	Tsienneto Rd E of Pinkerton	May-16	15,012	14,637	1113	1068	7.30%	1499	1469	10.04%	14,200	18,876	32.93%	19,457	1420	1953
	NH 102, E of NH 28 Bypass	May-16	7,456	7,270	595	571	7.85%	661	648	8.91%	7,016	6,126	-12.69%	6,348	499	566
	NH 28 Byp, N of Academy Dr	May-16	8,615	8,400	756	726	8.64%	881	863	10.27%	7,318	2,853	-61.01%	3,275	283	336
	NH 28 Byp, N of Tsienneto Rd	May-16	12,250	11,944	997	957	8.01%	1201	1177	9.85%	9,377	4,072	-56.57%	5,187	416	511
	NH 28 Byp, S of Thornton Rd (south)	May-16	14,341	13,982	1110	1066	7.62%	1392	1364	9.76%	12,227	7,327	-40.08%	8,379	639	817
	NH 102 E of Griffin St	Apr-14	16,410	16,820	1080	1037	6.17%	1224	1212	7.21%	18,002	20,810	15.60%	19,444	1199	1401
	NH 102 W of Abbot St	Apr-14	14,220	14,576	1020	979	6.72%	1148	1137	7.80%	11,128	14,902	33.91%	19,519	1311	1523
	Fordway over Beaver Brook	Apr-14	5,500	5,638	411	395	7.01%	481	476	8.44%	5,114	3,511	-31.35%	3,871	271	327
	Franklin St Ext, N. of Folsom Rd	Apr-14	1,795	1,840	109	105	5.71%	171	169	9.18%	1,254	1,959	56.22%	2,874	164	264
	Ash St at Londonderry town line	Apr-14	6,956	7,130	477	458	6.42%	722	715	10.03%	5,936	13,790	132.31%	16,564	1064	1661
	Crystal Av (NH 28), S of Rollins	Jun-15	13,134	13,134	1026	985	7.50%	1174	1104	8.41%	13,215	10,463	-20.82%	10,399	780	874
	NH 102, at Derry/Chester town line	Jul-15	8,200	8,200	644	670	8.17%	841	807	9.84%	10,839	12,783	17.94%	9,671	790	952
	average						7.11%			9.23%						
L-derry	NH 102, E of Hampton Dr	Jul-15	31,102	31,102	2478	2577	8.29%	2842	2728	8.77%	30,418	51,401	68.98%	52,557	4355	4610
	NH 102, E of Exit 4			26,800	2140		7.99%	2145		8.00%	20,818	32,410	55.68%	41,723	3332	3339
	NH 102 at Derry Town line	May-16	22,656	22,090	1718	1649	7.46%	1796	1760	7.97%	22,983	29,904	30.11%	28,742	2146	2290
	NH 28 at Derry Town line	May-16	17,324	16,891	1279	1228	7.27%	1682	1648	9.76%	19,392	15,638	-19.36%	13,621	990	1329
	NH 28 N of Liberty Dr	Sep-15	14,994	14,994	1407	1337	8.92%	1247	1210	8.07%	15,406	14,733	-4.37%	14,339	1279	1157
	Gilcreast Rd N of NH 102	May-16	10,070	9,818	697	669	6.81%	1008	988	10.06%	9,397	16,438	74.93%	17,174	1170	1728
	Londonderry Rd, N of NH 102			4,622	215	215	4.65%	465	465	10.06%	4,742	4,823	1.71%	4,701	219	473
	Ash St E of Londonderry Rd	Jun-15	6,591	6,591	477	458	6.95%	723	680	10.32%	5,949	14,001	135.35%	15,512	1078	1600
	average						7.29%			9.13%						
	Exit 4 NB Off-ramp	May-16	10,249	9,993	435	418	4.18%	1223	1199	12.00%	10,389	20,215	94.58%	19,444	813	2333
	Exit 4 NB On-ramp	May-16	10,303	10,045	1079	1036	10.31%	812	796	7.92%	9,550	21,343	123.49%	22,449	2315	1779
	Exit 4 SB Off-ramp	May-16	9,862	9,615	753	723	7.52%	952	933	9.70%	8,157	18,349	124.95%	21,629	1626	2099
	Exit 4 SB On-ramp - EB to SB	May-16	5,310	5,177	673	646	12.48%	311	305	5.89%	4,907	10,778	119.65%	11,371	1419	670
	Exit 4 SB On-ramp - WB to SB	May-16	4,767	4,648	537	516	11.10%	244	239	5.14%	3,637	7,402	103.52%	9,460	1050	486
	average						9.12%			8.13%						
	Exit 5 NB Off-ramp	May-16	5,745	5,601	400	384	6.86%	472	463	8.27%	4,430	6,401	44.49%	8,093	555	669
	Exit 5 NB On-ramp	May-16	9,580	9,341	992	952	10.19%	793	777	8.32%	9,101	13,499	48.32%	13,855	1412	1152
	Exit 5 SB Off-ramp	May-16	9,520	9,282	781	750	8.08%	939	920	9.91%	9,234	13,577	47.03%	13,648	1103	1353
	Exit 5 SB On-ramp	May-16	5,645	5,504	519	498	9.05%	427	418	7.59%	3,919	5,884	50.14%	8,264	748	628
	average						8.54%			8.52%						
	I-93, south of Exit 4 (DOT PATR)			71,060		5420	7.63%		5870	8.26%	72,378	118,908	64.29%	116,743	8,904	9,644
	NB			35,740		1980	36.5%		3410	58.1%	36,417	59,234	62.65%	58,133	3,253	5,602
	SB			35,320		3440	63.5%		2460	41.9%	35,961	59,674	65.94%	58,610	5,651	4,042
	I-93, between Exits 4 and 5			71,000		5640	7.94%		5885	8.29%	71,152	120,205	68.94%	119,948	9,528	9,942
	NB					2630	46.6%		3015	51.2%	35,578	60,363	69.66%	-	4,443	5,093
	SB					3010	53.4%		2870	48.8%	35,574	59,842	68.22%	-	5,085	4,849
	I-93, north of Exit 5			76,000		6425	8.45%		6690	8.80%	81,139	134,995	66.37%	126,445	10,690	11,130
	NB					3200	49.8%		3325	49.7%	40,250	67,460	67.60%	-	5,324	5,532
	SB					3225	50.2%		3365	50.3%	40,889	67,535	65.17%	-	5,366	5,598

	Adj 2015 AAWDT	Counted AM Peak Volume	Adj 2015 AM Peak Volume	AM Pk as % of AAWDT	Counted PM Peak Volume	Adj 2015 PM Peak Volume	PM Pk as % of AAWDT	2015 AWDT Base Model Assigns	2040 AAWDT No-Build Assigns	% Growth 2015-40	AAWDT) 2040 NB AAWDT	2040 NoBd AM Pk	2040 NoBd PM Pk

Note - Exit 5 SB off ramp AM peak volume does not include one count that appears anomalous when compared to other counts in same hour

Red counts are from NHDOT Town summary data - 2014 or 2015

11-Apr-17
rev 5-17-17
rev 9-14-17

TABLE J-1

Adjusted 2040 AAWDT and Peak Hour No-Build volumes based on 2015 counts

Annual Growth rates:
2014->2015 1.025
2015->2015 1.000
2016->2015 0.975

Seasonal: Use Urban Highway Group 4 adjustment factors
Intersection Turning Movement Counts

	Adj Factor=	AM Peak	PM Peak
April		0.96	0.99
May		0.96	0.98
June		0.96	0.94
July		1.04	0.96
Sept		0.95	0.97

	Count Location	Count Month/Yr	Raw AAWDT	Adj 2015 AAWDT	Counted AM Peak Volume	Adj 2015 AM Peak Volume	AM Pk as % of AAWDT	Counted PM Peak Volume	Adj 2015 PM Peak Volume	PM Pk as % of AAWDT	2015 AWDT Base Model Assigns	2040 AAWDT No-Build Assigns	% Growth 2015-40	(Apply % to 2015 adj AWDT) 2040 NB AAWDT	2040 NoBd AM Pk	2040 NoBd PM Pk
Derry	Crystal Av (NH 28), S of Tsienneto	May-16	15,585	15,195	836	803	5.28%	1418	1390	9.15%	13,406	10,220	-23.77%	11,584	612	1060
	Folsom Rd W of NH 28	May-16	12,070	11,768	778	747	6.35%	1199	1175	9.98%	8,960	10,537	17.60%	13,839	878	1382
	Pinkerton St E of Tsienneto	May-16	10,722	10,454	695	667	6.38%	1017	997	9.54%	8,776	6,396	-27.12%	7,619	486	727
	Tsiennto Rd, W of NH 102	May-16	5,532	5,394	483	464	8.60%	511	501	9.29%	5,666	9,072	60.11%	8,636	743	802
	Tsienneto Rd E of Pinkerton	May-16	15,012	14,637	1113	1068	7.30%	1499	1469	10.04%	14,200	18,876	32.93%	19,457	1420	1953
	NH 102, E of NH 28 Bypass	May-16	7,456	7,270	595	571	7.85%	661	648	8.91%	7,016	6,126	-12.69%	6,348	499	566
	NH 28 Byp, N of Academy Dr	May-16	8,615	8,400	756	726	8.64%	881	863	10.27%	7,318	2,853	-61.01%	3,275	283	336
	NH 28 Byp, N of Tsienneto Rd	May-16	12,250	11,944	997	957	8.01%	1201	1177	9.85%	9,377	4,072	-56.57%	5,187	416	511
	NH 28 Byp, S of Thornton Rd (south)	May-16	14,341	13,982	1110	1066	7.62%	1392	1364	9.76%	12,227	7,327	-40.08%	8,379	639	817
	NH 102 E of Griffin St	Apr-14	16,410	16,820	1080	1037	6.17%	1224	1212	7.21%	18,002	20,810	15.60%	19,444	1199	1401
	NH 102 W of Abbot St	Apr-14	14,220	14,576	1020	979	6.72%	1148	1137	7.80%	11,128	14,902	33.91%	19,519	1311	1523
	Fordway over Beaver Brook	Apr-14	5,500	5,638	411	395	7.01%	481	476	8.44%	5,114	3,511	-31.35%	3,871	271	327
	Franklin St Ext, N. of Folsom Rd	Apr-14	1,795	1,840	109	105	5.71%	171	169	9.18%	1,254	1,959	56.22%	2,874	164	264
	Ash St at Londonderry town line	Apr-14	6,956	7,130	477	458	6.42%	722	715	10.03%	5,936	13,790	132.31%	16,564	1064	1661
	Crystal Av (NH 28), S of Rollins	Jun-15	13,134	13,134	1026	985	7.50%	1174	1104	8.41%	13,215	10,463	-20.82%	10,399	780	874
	NH 102, at Derry/Chester town line	Jul-15	8,200	8,200	644	670	8.17%	841	807	9.84%	10,839	12,783	17.94%	9,671	790	952
	average						7.11%			9.23%						
L-derry	NH 102, E of Hampton Dr	Jul-15	31,102	31,102	2478	2577	8.29%	2842	2728	8.77%	30,418	51,401	68.98%	52,557	4355	4610
	NH 102, E of Exit 4			26,800	2140		7.99%	2145		8.00%	20,818	32,410	55.68%	41,723	3332	3339
	NH 102 at Derry Town line	May-16	22,656	22,090	1718	1649	7.46%	1796	1760	7.97%	22,983	29,904	30.11%	28,742	2146	2290
	NH 28 at Derry Town line	May-16	17,324	16,891	1279	1228	7.27%	1682	1648	9.76%	19,392	15,638	-19.36%	13,621	990	1329
	NH 28 N of Liberty Dr	Sep-15	14,994	14,994	1407	1337	8.92%	1247	1210	8.07%	15,406	14,733	-4.37%	14,339	1279	1157
	Gilcreast Rd N of NH 102	May-16	10,070	9,818	697	669	6.81%	1008	988	10.06%	9,397	16,438	74.93%	17,174	1170	1728
	Londonderry Rd, N of NH 102			4,622	215	215	4.65%	465	465	10.06%	4,742	4,823	1.71%	4,701	219	473
	Ash St E of Londonderry Rd	Jun-15	6,591	6,591	477	458	6.95%	723	680	10.32%	5,949	14,001	135.35%	15,512	1078	1600
	average						7.29%			9.13%						
	Exit 4 NB Off-ramp	May-16	10,249	9,993	435	418	4.18%	1223	1199	12.00%	10,389	20,215	94.58%	19,444	813	2333
	Exit 4 NB On-ramp	May-16	10,303	10,045	1079	1036	10.31%	812	796	7.92%	9,550	21,343	123.49%	22,449	2315	1779
	Exit 4 SB Off-ramp	May-16	9,862	9,615	753	723	7.52%	952	933	9.70%	8,157	18,349	124.95%	21,629	1626	2099
	Exit 4 SB On-ramp - EB to SB	May-16	5,310	5,177	673	646	12.48%	311	305	5.89%	4,907	10,778	119.65%	11,371	1419	670
	Exit 4 SB On-ramp - WB to SB	May-16	4,767	4,648	537	516	11.10%	244	239	5.14%	3,637	7,402	103.52%	9,460	1050	486
	average						9.12%			8.13%						
	Exit 5 NB Off-ramp	May-16	5,745	5,601	400	384	6.86%	472	463	8.27%	4,430	6,401	44.49%	8,093	555	669
	Exit 5 NB On-ramp	May-16	9,580	9,341	992	952	10.19%	793	777	8.32%	9,101	13,499	48.32%	13,855	1412	1152
	Exit 5 SB Off-ramp	May-16	9,520	9,282	781	750	8.08%	939	920	9.91%	9,234	13,577	47.03%	13,648	1103	1353
	Exit 5 SB On-ramp	May-16	5,645	5,504	519	498	9.05%	427	418	7.59%	3,919	5,884	50.14%	8,264	748	628
	average						8.54%			8.52%						
	I-93, south of Exit 4 (DOT PATR)			71,060		5420	7.63%		5870	8.26%	72,378	118,908	64.29%	116,743	8,904	9,644
	NB			35,740		1980	36.5%		3410	58.1%	36,417	59,234	62.65%	58,133	3,253	5,602
	SB			35,320		3440	63.5%		2460	41.9%	35,961	59,674	65.94%	58,610	5,651	4,042
	I-93, between Exits 4 and 5			71,000		5640	7.94%		5885	8.29%	71,152	120,205	68.94%	119,948	9,528	9,942
	NB					2630	46.6%		3015	51.2%	35,578	60,363	69.66%	-	4,443	5,093
	SB					3010	53.4%		2870	48.8%	35,574	59,842	68.22%	-	5,085	4,849
	I-93, north of Exit 5			76,000		6425	8.45%		6690	8.80%	81,139	134,995	66.37%	126,445	10,690	11,130
	NB					3200	49.8%		3325	49.7%	40,250	67,460	67.60%	-	5,324	5,532
	SB					3225	50.2%		3365	50.3%	40,889	67,535	65.17%	-	5,366	5,598

	Adj 2015 AAWDT	Counted AM Peak Volume	Adj 2015 AM Peak Volume	AM Pk as % of AAWDT	Counted PM Peak Volume	Adj 2015 PM Peak Volume	PM Pk as % of AAWDT	2015 AWDT Base Model Assigns	2040 AWDT No-Build Assigns	% Growth 2015-40	AAWDT) 2040 NB AAWDT	2040 NoBd AM Pk	2040 NoBd PM Pk

Note - Exit 5 SB off ramp AM peak volume does not include one count that appears anomalous when compared to other counts in same hour
Red counts are from NHDOT Town summary data - 2014 or 2015

11-Apr-17

rev 5-17-17

rev 9-14-17

TABLE J-2

Adjusted 2040 AADWDT and Peak Hour Alternative A volumes based on 2015 counts

Annual Growth rates:

2014->2015	1.025
2015->2015	1.000
2016->2015	0.975

Seasonal: Use Urban Highway Group 4 adjustment factors

Intersection Turning Movement Counts

	Adj Factor=	AM Peak	PM Peak
April		0.96	0.99
May		0.96	0.98
June		0.96	0.94
July		1.04	0.96
Sept		0.95	0.97

	Count Location	Count Month/Yr	Raw AADWDT	Adj 2015 AADWDT	Counted AM Peak Volume	Adj 2015 AM Peak Volume	AM Pk as % of AADWDT	Counted PM Peak Volume	Adj 2015 PM Peak Volume	PM Pk as % of AADWDT	2015 AWDT Base Model Assigns	2040 AWDT Alt A Assigns	% Growth 2015-40	(Apply % to Adj 2015 AADWDT) 2040 Alt A AADWDT	2040 NB Alt A AADWDT	%Difference 2040 Alt A to 2040 NB	2040 Alt A AM Pk	2040 Alt A PM Pk
Derry	Crystal Av (NH 28), S of Tsienneto	May-16	15,585	15,195	836	803	5.28%	1418	1390	9.15%	13,406	7,242	-45.98%	8,208	11,584	-41.13%	434	751
	Folsom Rd W of NH 28	May-16	12,070	11,768	778	747	6.35%	1199	1175	9.98%	8,960	29,612	230.49%	38,892	13,839	64.42%	2,469	3,883
	Pinkerton St E of Tsienneto	May-16	10,722	10,454	695	667	6.38%	1017	997	9.54%	8,776	9,059	3.22%	10,791	7,619	29.39%	689	1,029
	Tsiennto Rd, W of NH 102	May-16	5,532	5,394	483	464	8.60%	511	501	9.29%	5,666	10,824	91.03%	10,304	8,636	16.19%	886	957
	Tsienneto Rd E of Pinkerton	May-16	15,012	14,637	1113	1068	7.30%	1499	1469	10.04%	14,200	22,226	56.52%	22,910	19,457	15.07%	1,672	2,299
	NH 102, E of NH 28 Bypass	May-16	7,456	7,270	595	571	7.85%	661	648	8.91%	7,016	6,924	-1.31%	7,175	6,348	11.53%	564	640
	NH 28 Byp, N of Academy Dr	May-16	8,615	8,400	756	726	8.64%	881	863	10.27%	7,318	2,333	-68.12%	2,678	3,275	-22.29%	231	275
	NH 28 Byp, N of Tsienneto Rd	May-16	12,250	11,944	997	957	8.01%	1201	1177	9.85%	9,377	4,229	-54.90%	5,387	5,187	3.71%	432	531
	NH 28 Byp, S of Thornton Rd (south)	May-16	14,341	13,982	1110	1066	7.62%	1392	1364	9.76%	12,227	7,652	-37.42%	8,750	8,379	4.24%	667	854
	NH 102 E of Griffin St	Apr-14	16,410	16,820	1080	1037	6.17%	1224	1212	7.21%	18,002	16,885	-6.20%	15,776	19,444	-23.25%	973	1,137
	NH 102 W of Abbot St	Apr-14	14,220	14,576	1020	979	6.72%	1148	1137	7.80%	11,128	15,442	38.77%	20,227	19,519	3.50%	1,359	1,578
	Fordway over Beaver Brook	Apr-14	5,500	5,638	411	395	7.01%	481	476	8.44%	5,114	4,748	-7.16%	5,234	3,871	26.04%	367	442
	Franklin St Ext, N. of Folsom Rd	Apr-14	1,795	1,840	109	105	5.71%	171	169	9.18%	1,254	1,367	9.01%	2,006	2,874	-43.27%	114	184
	Ash St at Londonderry town line	Apr-14	6,956	7,130	477	458	6.42%	722	715	10.03%	5,936	6,065	2.17%	7,285	16,564	-127.37%	468	731
	Crystal Av (NH 28), S of Rollins	Jun-15	13,134	13,134	1026	985	7.50%	1174	1104	8.41%	13,215	11,087	-16.10%	11,019	10,399	5.63%	826	926
	NH 102, at Derry/Chester town line	Jul-15	8,200	8,200	644	670	8.17%	841	807	9.84%	10,839	14,181	30.83%	10,728	9,671	9.85%	877	1,056
	average						7.04%			9.19%								
L-derry	NH 102, E of Hampton Dr	Jul-15	31,102	31,102	2478	2577	8.29%	2842	2728	8.77%	30,418	56,306	85.11%	57,572	52,557	8.71%	4,770	5,050
	NH 102, E of Exit 4			26,800	2140		7.99%	2145		8.00%	20,818	15,723	-24.47%	20,241	41,723	-106.13%	1,616	1,620
	NH 102 at Derry Town line	May-16	22,656	22,090	1718	1649	7.46%	1796	1760	7.97%	22,983	20,413	-11.18%	19,620	28,742	-46.49%	1,465	1,563
	NH 28 at Derry Town line	May-16	17,324	16,891	1279	1228	7.27%	1682	1648	9.76%	19,392	9,440	-51.32%	8,223	13,621	-65.65%	598	802
	NH 28 N of Liberty Dr	Sep-15	14,994	14,994	1407	1337	8.92%	1247	1210	8.07%	15,406	9,984	-35.19%	9,717	14,339	-47.57%	866	784
	Gilcreast Rd N of NH 102	May-16	10,070	9,818	697	669	6.81%	1008	988	10.06%	9,397	15,318	63.01%	16,004	17,174	-7.31%	1,091	1,611
	Londonderry Rd, N of NH 102			4,622	215	215	4.65%	465	465	10.06%	4,742	6,536	37.83%	6,371	4,701	26.21%	296	641
	Ash St E of Londonderry Rd	Jun-15	6,591	6,591	477	458	6.95%	723	680	10.32%	5,949	6,065	1.95%	6,720	15,512	-130.83%	467	693
	average						7.29%			9.13%								
	Connector Rd, E. of Exit 4A						7.46%			7.97%		53,720					4,010	4,280
	Connector Rd, W. of N High St						7.46%			7.97%		40,974					3,059	3,265
	Exit 4 NB Off-ramp	May-16	10,249	9,993	435	418	4.18%	1223	1199	12.00%	10,389	18,073	73.96%	17,384	19,444	-11.85%	727	2,086
	Exit 4 NB On-ramp	May-16	10,303	10,045	1079	1036	10.31%	812	796	7.92%	9,550	15,150	58.64%	15,935	22,449	-40.88%	1,643	1,263
	Exit 4 SB Off-ramp	May-16	9,862	9,615	753	723	7.52%	952	933	9.70%	8,157	13,795	69.12%	16,261	21,629	-33.01%	1,223	1,578
	Exit 4 SB On-ramp - EB to SB	May-16	5,310	5,177	673	646	12.48%	311	305	5.89%	4,907	11,836	141.21%	12,487	11,371	8.94%	1,558	736
	Exit 4 SB On-ramp - WB to SB	May-16	4,767	4,648	537	516	11.10%	244	239	5.14%	3,637	3,879	6.65%	4,957	9,460	-90.84%	550	255
	average						9.12%			8.13%								
	Exit 4A NB Off-ramp											8,732		8,732			796	710
	Exit 4A NB On-ramp											15,240		15,240			1,390	1,239
	Exit 4A SB Off-ramp											18,996		18,996			1,732	1,545
	Exit 4A SB On-ramp											10,752		10,752			980	874
	Exit 5 NB Off-ramp	May-16	5,745	5,601	400	384	6.86%	472	463	8.27%	4,430	7,521	69.77%	9,509	8,093	14.89%	652	786
	Exit 5 NB On-ramp	May-16	9,580	9,341	992	952	10.19%	793	777	8.32%	9,101	10,863	19.36%	11,149	13,855	-24.27%	1,136	927
	Exit 5 SB Off-ramp	May-16	9,520	9,282	781	750	8.08%	939	920	9.91%	9,234	7,670	-16.94%	7,710	13,648	-77.02%	623	764
	Exit 5 SB On-ramp	May-16	5,645	5,504	519	498	9.05%	427	418	7.59%	3,919	6,879	75.53%	9,661	8,264	14.46%	874	734
	average						8.54%			8.52%								
	I-93, south of Exit 4 (DOT PATR)			71,060		5420	7.63%		5870	8.26%	72,378	123,109	70.09%	120,867	116,743	3.41%	9,219	9,984
	NB			35,740	1980		36.5%	3410		58.1%	36,417	61,455	68.75%	60,313	58,133	3.61%	3,368	5,800
	SB			35,320	3440		63.5%	2460		41.9%	35,961	61,654	71.45%	60,555	58,610	3.21%	5,851	4,184
	I-93, between Exits 4 and 4A			71,000		5640	7.94%		5885	8.29%	71,152	118,266	66.22%	118,013			9,375	9,782
	NB				2630		46.6%	3015		51.2%	35,578	58,532	64.52%	-			4,372	5,012
	SB				3010		53.4%	2870		48.8%	35,574	59,734	67.91%	-			5,003	4,770
	I-93, between Exits 4A and 5			71,000			7.94%			8.29%	71,152	133,018	86.95%	132,734	119,948	9.63%	10,544	11,002
	NB						46.63%			51.23%	35,578	65,040	82.81%		-		4,917	5,637
	SB						53.37%			48.77%	35,574	67,978	91.09%				5,627	5,365
	I-93, north of Exit 5			76,000		6425	8.45%		6690	8.80%	81,139	137,153	69.03%	128,466	126,445	1.57%	10,860	11,308
	NB				3200		49.8%	3325		49.7%	40,250	68,383	69.90%	-	-		5,409	5,620
	SB				3225		50.2%	3365		50.3%	40,889	68,770	68.19%	-	-		5,451	5,688

	Counted	Adj 2015		Counted	Adj 2015		2015 AWDT	2040 AWDT	%			%Difference	2040	2040
Adj 2015 AADWDT	AM Peak Volume	AM Peak Volume	AM Pk as % of AADWDT	PM Peak Volume	PM Peak Volume	PM Pk as % of AADWDT	Base Model Assigns	Alt A Assigns	Growth 2015-40	2040 Alt A AADWDT	2040 NB Alt A AADWDT	2040 Alt A to 2040 NB	Alt A AM Pk	Alt A PM Pk

Note - Exit 5 SB off ramp AM peak volume does not include one count that appears anomalous when compared to other counts in same hour

Red counts are from NHDOT Town summary data - 2014 or 2015

11-Apr-17

rev 5-17-17

rev 9-14-17

TABLE J-3

Adjusted 2040 AAWDT and Peak Hour Alternative B volumes based on 2015 counts

Annual Growth rates:

2014->2015	1.025
2015->2015	1.000
2016->2015	0.975

Seasonal: Use Urban Highway Group 4 adjustment factors

Intersection Turning Movement Counts

	Adj Factor=	AM Peak	PM Peak
April		0.96	0.99
May		0.96	0.98
June		0.96	0.94
July		1.04	0.96
Sept		0.95	0.97

	Count Location	Count Month/Yr	Raw AAWDT	Adj 2015 AAWDT	Counted AM Peak Volume	Adj 2015 AM Peak Volume	AM Pk as % of AAWDT	Counted PM Peak Volume	Adj 2015 PM Peak Volume	PM Pk as % of AAWDT	2015 AWDT Base Model Assigns	2040 AWDT Alt B Assigns	% Growth 2015-40	(Apply % to Adj 2015 AAWDT) 2040 Alt B AAWDT	2040 NB AAWDT	%Difference 2040 Alt B to 2040 NB	2040 Alt B AM Pk	2040 Alt B PM Pk
Derry	Crystal Av (NH 28), S of Tsienneto	May-16	15,585	15,195	836	803	5.28%	1418	1390	9.15%	13,406	10,565	-21.19%	11,975	11,584	3.27%	633	1095
	Folsom Rd W of NH 28	May-16	12,070	11,768	778	747	6.35%	1199	1175	9.98%	8,960	4,730	-47.21%	6,212	13,839	-122.78%	394	620
	Pinkerton St E of Tsienneto	May-16	10,722	10,454	695	667	6.38%	1017	997	9.54%	8,776	9,178	4.58%	10,933	7,619	30.31%	698	1043
	Tsiennto Rd, W of NH 102	May-16	5,532	5,394	483	464	8.60%	511	501	9.29%	5,666	16,182	185.60%	15,405	8,636	43.94%	1325	1431
	Tsienneto Rd E of Pinkerton	May-16	15,012	14,637	1113	1068	7.30%	1499	1469	10.04%	14,200	15,241	7.33%	15,710	19,457	-23.85%	1146	1577
	NH 102, E of NH 28 Bypass	May-16	7,456	7,270	595	571	7.85%	661	648	8.91%	7,016	4,277	-39.04%	4,432	6,348	-43.23%	348	395
	NH 28 Byp, N of Academy Dr	May-16	8,615	8,400	756	726	8.64%	881	863	10.27%	7,318	2,375	-67.55%	2,726	3,275	-20.14%	236	280
	NH 28 Byp, N of Tsienneto Rd	May-16	12,250	11,944	997	957	8.01%	1201	1177	9.85%	9,377	2,696	-71.25%	3,434	5,187	-51.05%	275	338
	NH 28 Byp, S of Thornton Rd (south)	May-16	14,341	13,982	1110	1066	7.62%	1392	1364	9.76%	12,227	7,791	-36.28%	8,909	8,379	5.95%	679	869
	NH 102 E of Griffin St	Apr-14	16,410	16,820	1080	1037	6.17%	1224	1212	7.21%	18,002	16,759	-6.90%	15,659	19,444	-24.17%	965	1128
	NH 102 W of Abbot St	Apr-14	14,220	14,576	1020	979	6.72%	1148	1137	7.80%	11,128	11,283	1.39%	14,779	19,519	-32.07%	993	1153
	Fordway over Beaver Brook	Apr-14	5,500	5,638	411	395	7.01%	481	476	8.44%	5,114	4,273	-16.45%	4,711	3,871	17.83%	330	398
	Franklin St Ext, N. of Folsom Rd	Apr-14	1,795	1,840	109	105	5.71%	171	169	9.18%	1,254	4,736	277.67%	6,949	2,874	58.64%	397	638
	Ash St at Londonderry town line	Apr-14	6,956	7,130	477	458	6.42%	722	715	10.03%	5,936	5,923	-0.22%	7,114	16,564	-132.84%	457	713
	Crystal Av (NH 28), S of Rollins	Jun-15	13,134	13,134	1026	985	7.50%	1174	1104	8.41%	13,215	11,110	-15.93%	11,042	10,399	5.82%	828	928
	NH 102, at Derry/Chester town line	Jul-15	8,200	8,200	644	670	8.17%	841	807	9.84%	10,839	14,668	35.33%	11,097	9,671	12.85%	907	1092
	average						7.11%			9.23%								
L-derry	NH 102, E of Hampton Dr	Jul-15	31,102	31,102	2478	2577	8.29%	2842	2728	8.77%	30,418	56,263	84.97%	57,528	52,557	8.64%	4767	5046
	NH 102, E of Exit 4			26,800	2140		7.99%	2145		8.00%	20,818	16,852	-19.05%	21,694	41,723	-92.33%	1732	1736
	NH 102 at Derry Town line	May-16	22,656	22,090	1718	1649	7.46%	1796	1760	7.97%	22,983	20,908	-9.03%	20,096	28,742	-43.02%	1500	1601
	NH 28 at Derry Town line	May-16	17,324	16,891	1279	1228	7.27%	1682	1648	9.76%	19,392	8,125	-58.10%	7,077	13,621	-92.47%	515	690
	NH 28 N of Liberty Dr	Sep-15	14,994	14,994	1407	1337	8.92%	1054	1022	6.82%	15,406	8,697	-43.55%	8,464	14,339	-69.41%	755	577
	Gilcreast Rd N of NH 102	May-16	10,070	9,818	697	669	6.81%	1008	988	10.06%	9,397	15,035	60.00%	15,709	17,174	-9.33%	1070	1581
	Londonderry Rd, N of NH 102			4,622	215	215	4.65%	446	465	10.06%	4,742	6,034	27.25%	5,881	4,701	20.06%	274	592
	Ash St E of Londonderry Rd	Jun-15	6,591	6,591	477	458	6.95%	723	680	10.32%	5,949	5,923	-0.44%	6,562	15,512	-136.39%	456	677
	average						7.29%			8.97%								
	Connector Rd, E. of Exit 4A											54,523					3,820	4,910
	Connector Rd, W. of NH 28											35,565					2,490	3,200
	Connector Rd, E. of NH 28											16,193					1,130	1,460
	Exit 4 NB Off-ramp	May-16	10,249	9,993	435	418	4.18%	1223	1199	12.00%	10,389	18,135	74.56%	17,444	19,444	-11.47%	730	2093
	Exit 4 NB On-ramp	May-16	10,303	10,045	1079	1036	10.31%	812	796	7.92%	9,550	17,638	84.69%	18,552	22,449	-21.01%	1913	1470
	Exit 4 SB Off-ramp	May-16	9,862	9,615	753	723	7.52%	952	933	9.70%	8,157	14,795	81.38%	17,439	21,629	-24.03%	1311	1692
	Exit 4 SB On-ramp - EB to SB	May-16	5,310	5,177	673	646	12.48%	311	305	5.89%	4,907	11,659	137.60%	12,301	11,371	7.56%	1535	725
	Exit 4 SB On-ramp - WB to SB	May-16	4,767	4,648	537	516	11.10%	244	239	5.14%	3,637	4,125	13.42%	5,272	9,460	-79.44%	585	271
	average						9.12%			8.13%								
	Exit 4A NB Off-ramp											9,488		9,488			865	772
	Exit 4A NB On-ramp											13,208		13,208			1,204	1,074
	Exit 4A SB Off-ramp											19,376		19,376			1,767	1,576
	Exit 4A SB On-ramp											12,450		12,450			1,135	1,012
	Exit 5 NB Off-ramp	May-16	5,745	5,601	400	384	6.86%	472	463	8.27%	4,430	7,036	58.83%	8,896	8,093	9.03%	610	735
	Exit 5 NB On-ramp	May-16	9,580	9,341	992	952	10.19%	793	777	8.32%	9,101	10,468	15.02%	10,744	13,855	-28.96%	1095	894
	Exit 5 SB Off-ramp	May-16	9,520	9,282	781	750	8.08%	939	920	9.91%	9,234	6,036	-34.63%	6,067	13,648	-124.95%	490	601
	Exit 5 SB On-ramp	May-16	5,645	5,504	519	498	9.05%	427	418	7.59%	3,919	5,355	36.64%	7,521	8,264	-9.88%	680	571
	average						8.54%			8.52%								
	I-93, south of Exit 4 (DOT PATR)			71,060		5420	7.63%		5870	8.26%	72,378	123,558	70.71%	121,308	116,743	3.76%	9,253	10,021
	NB			35,740	1980		36.53%	3410		58.1%	36,417	61,615	69.19%	60,470	58,133	3.86%	3,380	5,821
	SB			35,320	3440		63.47%	2460		41.9%	35,961	61,943	72.25%	60,839	58,610	3.66%	5,873	4,200
	I-93, between Exits 4 and 4A			71,000		5640	7.94%		5885	8.29%	71,152	122,072	71.57%	121,811			9,676	10,097
	NB				2630		46.63%	3015		51.2%	35,578	61,119	71.79%	-			4,512	5,173
	SB				3010		53.37%	2870		48.8%	35,574	60,953	71.34%	-			5,164	4,924
	I-93, between Exits 4A and 5			71,000			7.94%			8.29%	71,152	132,718	86.53%	132,434	119,948	9.43%	10,520	10,977
	NB						46.63%			51.2%	35,578	64,839	82.24%		-		4,906	5,624
	SB						53.37%			48.8%	35,574	67,879	90.81%				5,614	5,353
	I-93, north of Exit 5			76,000		6425	8.45%		6690	8.80%	81,139	136,851	68.66%	128,183	126,445	1.36%	10,837	11,283
	NB				3200		49.81%	3325		49.7%	40,250	68,290	69.66%	-	-		5,397	5,608
	SB				3225		50.19%	3365		50.3%	40,889	68,561	67.68%	-			5,440	5,675

	Count Location	Adj 2015 AAWDT	Counted AM Peak Volume	Adj 2015 AM Peak Volume	AM Pk as % of AAWDT	Counted PM Peak Volume	Adj 2015 PM Peak Volume	PM Pk as % of AAWDT	2015 AWDT Base Model Assigns	2040 AWDT Alt B Assigns	% Growth 2015-40	AAWDT) 2040 Alt B AAWDT	2040 NB AAWDT	%Difference 2040 Alt B to 2040 NB	2040 Alt B AM Pk	2040 Alt B PM Pk
	I-93, south of Exit 4 (DOT PATR)	71,060		5420	7.63%		5870	8.26%	72,378	123,558	70.71%	121,308	116,743	3.76%	9,253	10,021
	NB	35,740	1980		36.53%	3410		58.1%	36,417	61,615	69.19%	60,470	58,133	3.86%	3,380	5,821
	SB	35,320	3440		63.47%	2460		41.9%	35,961	61,943	72.25%	60,839	58,610	3.66%	5,873	4,200
	I-93, between Exits 4 and 4A	71,000		5640	7.94%		5885	8.29%	71,152	122,072	71.57%	121,811			9,676	10,097
	NB		2630		46.63%	3015		51.2%	35,578	61,119	71.79%	-			4,512	5,173
	SB		3010		53.37%	2870		48.8%	35,574	60,953	71.34%	-			5,164	4,924
	I-93, between Exits 4A and 5	71,000			7.94%			8.29%	71,152	132,718	86.53%	132,434	119,948	9.43%	10,520	10,977
	NB				46.63%			51.2%	35,578	64,839	82.24%		-		4,906	5,624
	SB				53.37%			48.8%	35,574	67,879	90.81%				5,614	5,353
	I-93, north of Exit 5	76,000		6425	8.45%		6690	8.80%	81,139	136,851	68.66%	128,183	126,445	1.36%	10,837	11,283
	NB		3200		49.81%	3325		49.7%	40,250	68,290	69.66%	-	-		5,397	5,608
	SB		3225		50.19%	3365		50.3%	40,889	68,561	67.68%	-			5,440	5,675

Note - Exit 5 SB off ramp AM peak volume does not include one count that appears anomalous when compared to other counts in same hour

Red counts are from NHDOT Town summary data - 2014 or 2015

11-Apr-17

rev 6-27-17

rev 9-14-17

TABLE J-4

Adjusted 2040 AAWDT and Peak Hour Alternative C volumes based on 2015 counts

Annual Growth rates:

2014->2015	1.025
2015->2015	1.000
2016->2015	0.975

Seasonal: Use Urban Highway Group 4 adjustment factors

Intersection Turning Movement Counts

	Adj Factor=	AM Peak	PM Peak
April		0.96	0.99
May		0.96	0.98
June		0.96	0.94
July		1.04	0.96
Sept		0.95	0.97

	Count Location	Count Month/Yr	Raw AAWDT	Adj 2015 AAWDT	Counted AM Peak Volume	Adj 2015 AM Peak Volume	AM Pk as % of AAWDT	Counted PM Peak Volume	Adj 2015 PM Peak Volume	PM Pk as % of AAWDT	2015 AWDT Base Model Assigns	2040 AWDT Alt C Assigns	% Growth 2015-40	(Apply % to Adj 2015 AAWDT) 2040 Alt C AAWDT	2040 NB AAWDT	%Difference 2040 Alt C to 2040 NB	2040 Alt C AM Pk	2040 Alt C PM Pk
Derry	Crystal Av (NH 28), S of Tsienneto	May-16	15,585	15,195	836	803	5.28%	1418	1390	9.15%	13,406	12,279	-8.41%	13,918	11,584	16.77%	736	1273
	Folsom Rd W of NH 28	May-16	12,070	11,768	778	747	6.35%	1199	1175	9.98%	8,960	9,494	5.96%	12,469	13,839	-10.99%	791	1245
	Pinkerton St E of Tsienneto	May-16	10,722	10,454	695	667	6.38%	1017	997	9.54%	8,776	11,138	26.91%	13,268	7,619	42.58%	847	1265
	Tsiennto Rd, W of NH 102	May-16	5,532	5,394	483	464	8.60%	511	501	9.29%	5,666	6,156	8.65%	5,860	8,636	-47.37%	504	544
	Tsienneto Rd E of Pinkerton	May-16	15,012	14,637	1113	1068	7.30%	1499	1469	10.04%	14,200	15,644	10.17%	16,125	19,457	-20.66%	1177	1618
	NH 102, E of NH 28 Bypass	May-16	7,456	7,270	595	571	7.85%	661	648	8.91%	7,016	3,324	-52.62%	3,444	6,348	-84.32%	270	307
	NH 28 Byp, N of Academy Dr	May-16	8,615	8,400	756	726	8.64%	881	863	10.27%	7,318	2,436	-66.71%	2,796	3,275	-17.13%	242	287
	NH 28 Byp, N of Tsienneto Rd	May-16	12,250	11,944	997	957	8.01%	1201	1177	9.85%	9,377	2,290	-75.58%	2,917	5,187	-77.82%	234	287
	NH 28 Byp, S of Thornton Rd (south)	May-16	14,341	13,982	1110	1066	7.62%	1392	1364	9.76%	12,227	8,741	-28.51%	9,996	8,379	16.18%	762	975
	NH 102 E of Griffin St	Apr-14	16,410	16,820	1080	1037	6.17%	1224	1212	7.21%	18,002	16,330	-9.29%	15,258	19,444	-27.43%	941	1099
	NH 102 W of Abbot St	Apr-14	14,220	14,576	1020	979	6.72%	1148	1137	7.80%	11,128	9,968	-10.42%	13,057	19,519	-49.49%	877	1019
	Fordway over Beaver Brook	Apr-14	5,500	5,638	411	395	7.01%	481	476	8.44%	5,114	4,206	-17.76%	4,637	3,871	16.52%	325	391
	Franklin St Ext, N. of Folsom Rd	Apr-14	1,795	1,840	109	105	5.71%	171	169	9.18%	1,254	2,083	66.11%	3,056	2,874	5.96%	174	281
	Ash St at Londonderry town line	Apr-14	6,956	7,130	477	458	6.42%	722	715	10.03%	5,936	8,843	48.97%	10,622	16,564	-55.94%	682	1065
	Crystal Av (NH 28), S of Rollins	Jun-15	13,134	13,134	1026	985	7.50%	1174	1104	8.41%	13,215	11,753	-11.06%	6,341	10,399	-64.00%	407	636
	NH 102, at Derry/Chester town line	Jul-15	8,200	8,200	644	670	8.17%	841	807	9.84%	10,839	14,002	29.18%	16,967	9,671	43.00%	1272	1426
	average						7.11%			9.23%								
L-derry	NH 102, E of Hampton Dr	Jul-15	31,102	31,102	2478	2577	8.29%	2842	2728	8.77%	30,418	50,680	66.61%	51,820	52,557	-1.42%	4294	4545
	NH 102, E of Exit 4			26,800	2140		7.99%	2145		8.00%	20,818	18,986	-8.80%	24,442	41,723	-70.70%	1952	1956
	NH 102 at Derry Town line	May-16	22,656	22,090	1718	1649	7.46%	1796	1760	7.97%	22,983	21,661	-5.75%	20,819	28,742	-38.06%	1554	1659
	NH 28 at Derry Town line	May-16	17,324	16,891	1279	1228	7.27%	1682	1648	9.76%	19,392	42,458	118.95%	36,982	13,621	63.17%	2689	3608
	NH 28 N of Liberty Dr	Sep-15	14,994	14,994	1407	1337	8.92%	1247	1210	8.07%	15,406	4,904	-68.17%	4,773	14,339	-200.42%	426	385
	Gilcreast Rd N of NH 102	May-16	10,070	9,818	697	669	6.81%	1008	988	10.06%	9,397	15,112	60.82%	15,789	17,174	-8.77%	1076	1589
	Londonderry Rd, N of NH 102			4,622	215	215	4.65%	465	465	10.06%	4,742	7,633	60.97%	7,440	4,701	36.81%	346	749
	Ash St E of Londonderry Rd	Jun-15	6,591	6,591	477	458	6.95%	723	680	10.32%	5,949	8,682	45.94%	9,619	15,512	-61.26%	668	992
	average						7.29%			9.13%								
	Connector Rd, E. of Exit 4A											38,516					2,700	3,470
	Connector Rd, E. of NH 28											13,888					970	1,250
	Connector Rd, N. of NH 102											15,529					1,090	1,400
	Exit 4 NB Off-ramp	May-16	10,249	9,993	435	418	4.18%	1223	1199	12.00%	10,389	18,728	80.27%	18,014	19,444	-7.94%	754	2161
	Exit 4 NB On-ramp	May-16	10,303	10,045	1079	1036	10.31%	812	796	7.92%	9,550	15,903	66.52%	16,727	22,449	-34.21%	1725	1326
	Exit 4 SB Off-ramp	May-16	9,862	9,615	753	723	7.52%	952	933	9.70%	8,157	12,694	55.62%	14,963	21,629	-44.55%	1125	1452
	Exit 4 SB On-ramp - EB to SB	May-16	5,310	5,177	673	646	12.48%	311	305	5.89%	4,907	10,850	121.11%	11,447	11,371	0.66%	1428	674
	Exit 4 SB On-ramp - WB to SB	May-16	4,767	4,648	537	516	11.10%	244	239	5.14%	3,637	5,140	41.33%	6,569	9,460	-44.01%	729	338
	average						9.12%			8.13%								
	Exit 4A NB Off-ramp											2,795		2,795			255	227
	Exit 4A NB On-ramp											13,410		13,410			1,223	1,090
	Exit 4A SB Off-ramp											17,290		17,290			1,577	1,406
	Exit 4A SB On-ramp											5,021		5,021			458	408
	Exit 5 NB Off-ramp	May-16	5,745	5,601	400	384	6.86%	472	463	8.27%	4,430	6,626	49.57%	8,377	8,093	3.39%	574	692
	Exit 5 NB On-ramp	May-16	9,580	9,341	992	952	10.19%	793	777	8.32%	9,101	7,829	-13.98%	8,035	13,855	-72.43%	819	668
	Exit 5 SB Off-ramp	May-16	9,520	9,282	781	750	8.08%	939	920	9.91%	9,234	5,728	-37.97%	5,758	13,648	-137.03%	465	571
	Exit 5 SB On-ramp	May-16	5,645	5,504	519	498	9.05%	427	418	7.59%	3,919	5,916	50.96%	8,309	8,264	0.54%	752	631
	average						8.54%			8.52%								
	I-93, south of Exit 4 (DOT PATR)			71,060		5420	7.63%		5870	8.26%	72,378	119,322	64.86%	117,149	116,743	0.35%	8,935	9,677
	NB				1980	36.53%		3410	58.1%		36,417	59,601	63.66%	-	58,133		3,264	5,622
	SB				3440	63.47%		2460	41.9%		35,961	59,721	66.07%	-	58,610		5,671	4,055
	I-93, between Exits 4 and 4A			71,000		5640	7.94%		5885	8.29%	71,152	113,200	59.10%	112,958			8,973	9,363
	NB				2630	46.63%		3015	51.2%		35,578	56,776	59.58%	-			4,184	4,797
	SB				3010	53.37%		2870	48.8%		35,574	56,424	58.61%	-			4,789	4,566
	I-93, between Exits 4A and 5			71,000			7.94%			8.29%	71,152	136,083	91.26%	135,792	119,948	11.67%	10,787	11,255
	NB						46.63%			51.2%	35,578	67,390	89.41%		-		5,030	5,766
	SB						53.37%			48.8%	35,574	68,693	93.10%		-		5,757	5,489
	I-93, north of Exit 5			76,000		6425	8.45%		6690	8.80%	81,139	137,099	68.97%	128,416	126,445	1.53%	10,856	11,304
	NB				3200	49.81%		3325	49.7%		40,250	68,593	70.42%	-			5,407	5,618
	SB				3225	50.19%		3365	50.3%		40,889	68,506	67.54%	-			5,449	5,686

	Adj 2015 AAWDT	Counted AM Peak Volume	Adj 2015 AM Peak Volume	AM Pk as % of AAWDT	Counted PM Peak Volume	Adj 2015 PM Peak Volume	PM Pk as % of AAWDT	2015 AWDT Base Model Assigns	2040 AWDT Alt C Assigns	% Growth 2015-40	AAWDT) 2040 Alt C AAWDT	AAWDT) 2040 NB AAWDT	%Difference 2040 Alt C to 2040 NB	2040 Alt C AM Pk	2040 Alt C PM Pk

Note - Exit 5 SB off ramp AM peak volume does not include one count that appears anomalous when compared to other counts in same hour

Red counts are from NHDOT Town summary data - 2014 or 2015

11-Apr-17

rev 5-17-17

rev 9-14-17

TABLE J-5

Adjusted 2040 AAWDT and Peak Hour Alternative D volumes based on 2015 counts

Annual Growth rates:	
2014->2015	1.025
2015->2015	1.000
2016->2015	0.975

Seasonal: Use Urban Highway Group 4 adjustment factors

Intersection Turning Movement Counts

	Adj Factor=	AM Peak	PM Peak
April		0.96	0.99
May		0.96	0.98
June		0.96	0.94
July		1.04	0.96
Sept		0.95	0.97

	Count Location	Count Month/Yr	Raw AAWDT	Adj 2015 AAWDT	Counted AM Peak Volume	Adj 2015 AM Peak Volume	AM Pk as % of AAWDT	Counted PM Peak Volume	Adj 2015 PM Peak Volume	PM Pk as % of AAWDT	2015 AWDT Base Model Assigns	2040 AWDT Alt D Assigns	% Growth 2015-40	(Apply % to Adj 2015 AAWDT) 2040 Alt D AAWDT	2040 NB AAWDT	%Difference 2040 Alt D to 2040 NB	2040 Alt D AM Pk	2040 Alt D PM Pk
Derry	Crystal Av (NH 28), S of Tsienneto	May-16	15,585	15,195	836	803	5.28%	1418	1390	9.15%	13,406	13,225	-1.35%	14,990	11,584	22.72%	792	1371
	Folsom Rd W of NH 28	May-16	12,070	11,768	778	747	6.35%	1199	1175	9.98%	8,960	8,646	-3.50%	11,356	13,839	-21.87%	721	1134
	Pinkerton St E of Tsienneto	May-16	10,722	10,454	695	667	6.38%	1017	997	9.54%	8,776	11,608	32.27%	13,827	7,619	44.90%	882	1319
	Tsiennto Rd, W of NH 102	May-16	5,532	5,394	483	464	8.60%	511	501	9.29%	5,666	11,363	100.55%	10,818	8,636	20.17%	931	1005
	Tsienneto Rd E of Pinkerton	May-16	15,012	14,637	1113	1068	7.30%	1499	1469	10.04%	14,200	20,041	41.13%	20,658	19,457	5.81%	1507	2073
	NH 102, E of NH 28 Bypass	May-16	7,456	7,270	595	571	7.85%	661	648	8.91%	7,016	5,942	-15.31%	6,157	6,348	-3.10%	484	549
	NH 28 Byp, N of Academy Dr	May-16	8,615	8,400	756	726	8.64%	881	863	10.27%	7,318	2,420	-66.93%	2,778	3,275	-17.89%	240	285
	NH 28 Byp, N of Tsienneto Rd	May-16	12,250	11,944	997	957	8.01%	1201	1177	9.85%	9,377	4,218	-55.02%	5,373	5,187	3.46%	431	529
	NH 28 Byp, S of Thornton Rd (south)	May-16	14,341	13,982	1110	1066	7.62%	1392	1364	9.76%	12,227	8,136	-33.46%	9,304	8,379	9.94%	709	908
	NH 102 E of Griffin St	Apr-14	16,410	16,820	1080	1037	6.17%	1224	1212	7.21%	18,002	18,591	3.27%	17,370	19,444	-11.94%	1071	1252
	NH 102 W of Abbot St	Apr-14	14,220	14,576	1020	979	6.72%	1148	1137	7.80%	11,128	11,885	6.80%	15,568	19,519	-25.38%	1046	1214
	Fordway over Beaver Brook	Apr-14	5,500	5,638	411	395	7.01%	481	476	8.44%	5,114	3,926	-23.23%	4,328	3,871	10.56%	303	365
	Franklin St Ext, N. of Folsom Rd	Apr-14	1,795	1,840	109	105	5.71%	171	169	9.18%	1,254	2,019	61.00%	2,962	2,874	2.97%	169	272
	Ash St at Londonderry town line	Apr-14	6,956	7,130	477	458	6.42%	722	715	10.03%	5,936	8,511	43.38%	10,223	16,564	-62.03%	657	1025
	Crystal Av (NH 28), S of Rollins	Jun-15	13,134	13,134	1026	985	7.50%	1174	1104	8.41%	13,215	11,998	-9.21%	11,924	10,399	12.79%	894	1002
	NH 102, at Derry/Chester town line	Jul-15	8,200	8,200	644	670	8.17%	841	807	9.84%	10,839	14,138	30.44%	10,696	9,671	9.58%	874	1053
	average						7.11%			9.23%								
L-derry	NH 102, E of Hampton Dr	Jul-15	31,102	31,102	2478	2577	8.29%	2842	2728	8.77%	30,418	51,066	67.88%	52,214	52,557	-0.66%	4326	4580
	NH 102, E of Exit 4			26,800	2140		7.99%	2145		8.00%	20,818	20,775	-0.21%	26,745	41,723	-56.00%	2136	2141
	NH 102 at Derry Town line	May-16	22,656	22,090	1718	1649	7.46%	1796	1760	7.97%	22,983	23,215	1.01%	22,313	28,742	-28.81%	1666	1778
	NH 28 at Derry Town line	May-16	17,324	16,891	1279	1228	7.27%	1682	1648	9.76%	19,392	40,462	108.65%	35,244	13,621	61.35%	2562	3439
	NH 28 N of Liberty Dr	Sep-15	14,994	14,994	1407	1337	8.92%	1247	1210	8.07%	15,406	4,757	-69.12%	4,630	14,339	-209.70%	413	374
	Gilcreast Rd N of NH 102	May-16	10,070	9,818	697	669	6.81%	1008	988	10.06%	9,397	14,742	56.88%	15,402	17,174	-11.50%	1049	1550
	Londonderry Rd, N of NH 102			4,622	215	215	4.65%	465	465	10.06%	4,742	7,354	55.08%	7,168	4,701	34.42%	333	721
	Ash St E of Londonderry Rd	Jun-15	6,591	6,591	477	458	6.95%	723	680	10.32%	5,949	8,457	42.16%	9,370	15,512	-65.55%	651	967
	average						7.29%			9.13%								
	Connector Rd, E. of Exit 4A											36,728					2,570	3,310
	Exit 4 NB Off-ramp	May-16	10,249	9,993	435	418	4.18%	1223	1199	12.00%	10,389	19,497	87.67%	18,754	19,444	-3.68%	784	2250
	Exit 4 NB On-ramp	May-16	10,303	10,045	1079	1036	10.31%	812	796	7.92%	9,550	15,411	61.37%	16,210	22,449	-38.49%	1672	1285
	Exit 4 SB Off-ramp	May-16	9,862	9,615	753	723	7.52%	952	933	9.70%	8,157	12,431	52.40%	14,653	21,629	-47.61%	1102	1422
	Exit 4 SB On-ramp - EB to SB	May-16	5,310	5,177	673	646	12.48%	311	305	5.89%	4,907	10,881	121.74%	11,480	11,371	0.95%	1433	676
	Exit 4 SB On-ramp - WB to SB	May-16	4,767	4,648	537	516	11.10%	244	239	5.14%	3,637	5,152	41.66%	6,584	9,460	-43.68%	731	339
	average						9.12%			8.13%								
	Exit 4A NB Off-ramp											1,504		1,504			137	122
	Exit 4A NB On-ramp											13,630		13,630			1,243	1,108
	Exit 4A SB Off-ramp											16,972		16,972			1,548	1,380
	Exit 4A SB On-ramp											4,621		4,621			421	376
	Exit 5 NB Off-ramp	May-16	5,745	5,601	400	384	6.86%	472	463	8.27%	4,430	7,054	59.23%	8,919	8,093	9.26%	611	737
	Exit 5 NB On-ramp	May-16	9,580	9,341	992	952	10.19%	793	777	8.32%	9,101	7,985	-12.26%	8,196	13,855	-69.05%	835	682
	Exit 5 SB Off-ramp	May-16	9,520	9,282	781	750	8.08%	939	920	9.91%	9,234	5,790	-37.30%	5,820	13,648	-134.50%	470	577
	Exit 5 SB On-ramp	May-16	5,645	5,504	519	498	9.05%	427	418	7.59%	3,919	5,879	50.01%	8,257	8,264	-0.08%	747	627
	average						8.54%			8.52%								
	I-93, south of Exit 4 (DOT PATR)			71,060		5420	7.63%		5870	8.26%	72,378	119,380	64.94%	117,206	116,743	0.40%	8,940	9,682
	NB				1980		36.53%	3410		58.1%	36,417	59,527	63.46%	-	58,133		3,266	5,624
	SB				3440		63.47%	2460		41.9%	35,961	59,853	66.44%	-	58,610		5,674	4,058
	I-93, between Exits 4 and 4A			71,000		5640	7.94%		5885	8.29%	71,152	111,723	57.02%	111,484			8,856	9,241
	NB				2630		46.63%	3015		51.2%	35,578	55,441	55.83%	-			4,130	4,734
	SB				3010		53.37%	2870		48.8%	35,574	56,282	58.21%	-			4,726	4,507
	I-93, between Exits 4A and 5			71,000			7.94%			8.29%	71,152	136,200	91.42%	135,909	119,948	11.74%	10,796	11,265
	NB						46.63%			51.2%	35,578	67,567	89.91%		-		5,034	5,771
	SB						53.37%			48.8%	35,574	68,633	92.93%		-		5,762	5,494
	I-93, north of Exit 5			76,000		6425	8.45%		6690	8.80%	81,139	137,042	68.90%	128,362	126,445	1.49%	10,852	11,299
	NB				3200		49.81%	3325		49.7%	40,250	68,497	70.18%	-	-		5,405	5,616
	SB				3225		50.19%	3365		50.3%	40,889	68,545	67.64%	-	-		5,447	5,683

	Adj 2015 AAWDT	Counted AM Peak Volume	Adj 2015 AM Peak Volume	AM Pk as % of AAWDT	Counted PM Peak Volume	Adj 2015 PM Peak Volume	PM Pk as % of AAWDT	2015 AWDT Base Model Assigns	2040 AWDT Alt D Assigns	% Growth 2015-40	AAWDT) 2040 Alt D AAWDT	AAWDT) 2040 NB AAWDT	%Difference 2040 Alt D to 2040 NB	2040 Alt D AM Pk	2040 Alt D PM Pk

Note - Exit 5 SB off ramp AM peak volume does not include one count that appears anomalous when compared to other counts in same hour

Red counts are from NHDOT Town summary data - 2014 or 2015

11-Apr-17
rev 5-17-17
rev 9-14-17

TABLE J-6

Adjusted 2040 AAWDT and Peak Hour Alternative F volumes based on 2015 counts

Annual Growth rates:
2014->2015 1.025
2015->2015 1.000
2016->2015 0.975

Seasonal: Use Urban Highway Group 4 adjustment factors
Intersection Turning Movement Counts

	Adj Factor= AM Peak	PM Peak
April	0.96	0.99
May	0.96	0.98
June	0.96	0.94
July	1.04	0.96
Sept	0.95	0.97

	Count Location	Count Month/Yr	Raw AAWDT	Adj 2015 AAWDT	Counted AM Peak Volume	Adj 2015 AM Peak Volume	AM Pk as % of AAWDT	Counted PM Peak Volume	Adj 2015 PM Peak Volume	PM Pk as % of AAWDT	2015 AWDT Base Model Assigns	2040 AWDT Alt F Assigns	% Growth 2015-40	(Apply % to Adj 2015 AAWDT) 2040 Alt F AAWDT	2040 NB AAWDT	%Difference 2040 Alt F to 2040 NB	2040 Alt F AM Pk	2040 Alt F PM Pk
Derry	Crystal Av (NH 28), S of Tsienneto	May-16	15,585	15,195	836	803	5.28%	1418	1390	9.15%	13,406	10,313	-23.07%	11,689	11,584	0.90%	618	1069
	Folsom Rd W of NH 28	May-16	12,070	11,768	778	747	6.35%	1199	1175	9.98%	8,960	9,223	2.94%	12,113	13,839	-14.25%	769	1209
	Pinkerton St E of Tsienneto	May-16	10,722	10,454	695	667	6.38%	1017	997	9.54%	8,776	6,356	-27.58%	7,571	7,619	-0.63%	483	722
	Tsiennto Rd, W of NH 102	May-16	5,532	5,394	483	464	8.60%	511	501	9.29%	5,666	9,191	62.21%	8,750	8,636	1.30%	753	813
	Tsienneto Rd E of Pinkerton	May-16	15,012	14,637	1113	1068	7.30%	1499	1469	10.04%	14,200	18,976	33.63%	19,560	19,457	0.53%	1427	1963
	NH 102, E of NH 28 Bypass	May-16	7,456	7,270	595	571	7.85%	661	648	8.91%	7,016	6,450	-8.07%	6,684	6,348	5.03%	525	596
	NH 28 Byp, N of Academy Dr	May-16	8,615	8,400	756	726	8.64%	881	863	10.27%	7,318	2,785	-61.94%	3,197	3,275	-2.44%	276	328
	NH 28 Byp, N of Tsienneto Rd	May-16	12,250	11,944	997	957	8.01%	1201	1177	9.85%	9,377	4,145	-55.80%	5,280	5,187	1.76%	423	520
	NH 28 Byp, S of Thornton Rd (south)	May-16	14,341	13,982	1110	1066	7.62%	1392	1364	9.76%	12,227	7,191	-41.19%	8,223	8,379	-1.90%	627	802
	NH 102 E of Griffin St	Apr-14	16,410	16,820	1080	1037	6.17%	1224	1212	7.21%	18,002	24,147	34.14%	22,562	19,444	13.82%	1391	1626
	NH 102 W of Abbot St	Apr-14	14,220	14,576	1020	979	6.72%	1148	1137	7.80%	11,128	15,829	42.24%	20,734	19,519	5.86%	1393	1617
	Fordway over Beaver Brook	Apr-14	5,500	5,638	411	395	7.01%	481	476	8.44%	5,114	3,595	-29.70%	3,963	3,871	2.32%	278	335
	Franklin St Ext, N. of Folsom Rd	Apr-14	1,795	1,840	109	105	5.71%	171	169	9.18%	1,254	1,783	42.19%	2,616	2,874	-9.86%	149	240
	Ash St at Londonderry town line	Apr-14	6,956	7,130	477	458	6.42%	722	715	10.03%	5,936	12,825	116.05%	15,405	16,564	-7.52%	990	1545
	Crystal Av (NH 28), S of Rollins	Jun-15	13,134	13,134	1026	985	7.50%	1174	1104	8.41%	13,215	11,022	-16.59%	10,954	10,399	5.07%	822	921
	NH 102, at Derry/Chester town line	Jul-15	8,200	8,200	644	670	8.17%	841	807	9.84%	10,839	12,808	18.17%	9,690	9,671	0.20%	792	954
	average						7.11%			9.23%								
L-derry	NH 102, E of Hampton Dr	Jul-15	31,102	31,102	2478	2577	8.29%	2842	2728	8.77%	30,418	52,565	72.81%	53,747	52,557	2.21%	4453	4714
	NH 102, E of Exit 4			26,800	2140		7.99%	2145		8.00%	20,818	34,151	64.05%	43,964	41,723	5.10%	3511	3519
	NH 102 at Derry Town line	May-16	22,656	22,090	1718	1649	7.46%	1796	1760	7.97%	22,983	32,520	41.50%	31,256	28,742	8.04%	2333	2490
	NH 28 at Derry Town line	May-16	17,324	16,891	1279	1228	7.27%	1682	1648	9.76%	19,392	15,477	-20.19%	13,481	13,621	-1.04%	980	1315
	NH 28 N of Liberty Dr	Sep-15	14,994	14,994	1407	1337	8.92%	1247	1210	8.07%	15,406	14,584	-5.34%	14,194	14,339	-1.02%	1266	1145
	Gilcreast Rd N of NH 102	May-16	10,070	9,818	697	669	6.81%	1008	988	10.06%	9,397	16,006	70.33%	16,723	17,174	-2.70%	1140	1683
	Londonderry Rd, N of NH 102			4,622	215	215	4.65%	465	465	10.06%	4,742	4,521	-4.66%	4,407	4,701	-6.67%	205	443
	Ash St E of Londonderry Rd	Jun-15	6,591	6,591	477	458	6.95%	723	680	10.32%	5,949	13,023	118.91%	14,428	15,512	-7.51%	1003	1489
	average						7.29%			9.13%								
	Exit 4 NB Off-ramp	May-16	10,249	9,993	435	418	4.18%	1223	1199	12.00%	10,389	20,417	96.53%	19,639	19,444	0.99%	821	2356
	Exit 4 NB On-ramp	May-16	10,303	10,045	1079	1036	10.31%	812	796	7.92%	9,550	21,378	123.85%	22,486	22,449	0.16%	2319	1782
	Exit 4 SB Off-ramp	May-16	9,862	9,615	753	723	7.52%	952	933	9.70%	8,157	18,730	129.62%	22,078	21,629	2.03%	1660	2142
	Exit 4 SB On-ramp - EB to SB	May-16	5,310	5,177	673	646	12.48%	311	305	5.89%	4,907	10,705	118.16%	11,294	11,371	-0.68%	1409	665
	Exit 4 SB On-ramp - WB to SB	May-16	4,767	4,648	537	516	11.10%	244	239	5.14%	3,637	7,494	106.05%	9,577	9,460	1.22%	1063	492
	average						9.12%			8.13%								
	Exit 5 NB Off-ramp	May-16	5,745	5,601	400	384	6.86%	472	463	8.27%	4,430	6,256	41.22%	7,910	8,093	-2.31%	542	654
	Exit 5 NB On-ramp	May-16	9,580	9,341	992	952	10.19%	793	777	8.32%	9,101	13,329	46.46%	13,680	13,855	-1.28%	1394	1138
	Exit 5 SB Off-ramp	May-16	9,520	9,282	781	750	8.08%	939	920	9.91%	9,234	12,249	32.65%	12,313	13,648	-10.84%	995	1220
	Exit 5 SB On-ramp	May-16	5,645	5,504	519	498	9.05%	427	418	7.59%	3,919	5,882	50.09%	8,261	8,264	-0.04%	747	627
	average						8.54%			8.52%								
	I-93, south of Exit 4 (DOT PATR)			71,060		5420	7.63%		5870	8.26%	72,378	119,129	64.59%	116,960	116,743	0.19%	8,921	9,662
	NB					1980	36.53%		3410	58.09%	36,417	59,424	63.18%	-	58,133		3,259	5,613
	SB					3440	63.47%		2460	41.91%	35,961	59,705	66.03%	-	58,610		5,662	4,049
	I-93, between Exits 4 and 5			71,000		5640	7.94%		5885	8.29%	71,152	120,621	69.53%	120,363	119,948	0.34%	9,561	9,977
	NB					2630	46.63%		3015	51.23%	35,578	60,385	69.73%	-	-		4,458	5,111
	SB					3010	53.37%		2870	48.77%	35,574	60,236	69.33%	-	-		5,103	4,866
	I-93, north of Exit 5			76,000		6425	8.45%		6690	8.80%	81,139	135,061	66.46%	126,507	126,445	0.05%	10,695	11,136
	NB					3200	49.81%		3325	49.7%	40,250	67,458	67.60%	-	-		5,327	5,535
	SB					3225	50.19%		3365	50.3%	40,889	67,603	65.33%	-	-		5,368	5,601

	Adj 2015 AAWDT	Counted AM Peak Volume	Adj 2015 AM Peak Volume	AM Pk as % of AAWDT	Counted PM Peak Volume	Adj 2015 PM Peak Volume	PM Pk as % of AAWDT	2015 AWDT Base Model Assigns	2040 AWDT Alt F Assigns	% Growth 2015-40	AAWDT) 2040 Alt F AAWDT	2040 NB AAWDT	%Difference 2040 Alt F to 2040 NB	2040 Alt F AM Pk	2040 Alt F PM Pk

Note - Exit 5 SB off ramp AM peak volume does not include one count that appears anomalous when compared to other counts in same hour

Red counts are from NHDOT Town summary data - 2014 or 2015

APPENDIX K: PROCEDURE TO ESTIMATE TMC FROM AWDT

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TO: File

FROM: Paul Konieczka, AICP PK
Linda C. Greer, PE, PTOE L.G.

DATE: September 29, 2017

RE: Traffic Technical Memo
Procedure for Estimating Intersection Turning Movement Volumes from Exit 4A Model AWDT's
CLD | Fuss & O'Neill Reference No. 05-0244

The Exit 4A project has been using the Southern New Hampshire Planning Commission's (SNHPC) regional travel demand model to develop traffic projections for the 2015 base year and 2040 design year for the No-Build and the five 4A alternative interchange/connector road configurations. This model provides Average Weekday Traffic volumes (AWDTs) based on existing traffic volume information and existing/projected land use and socio-economic data for the SNHPC region, and has been calibrated by SNHPC to replicate base conditions to current standards.

However, the model is only calibrated to daily volumes on the primary roadway segments in the SNHPC area and not down to the intersection level. Therefore, for design purposes, these AWDT volumes must be converted into AM and PM peak hour turning movement volumes at the key intersections in the Exit 4A study area for each alternative for analysis so that the appropriate level of roadway and intersection improvements can be determined to serve the expected traffic demands in the 2040 design year, as well as to determine the expected level of impact of each alternative on natural and cultural resources for the SDEIS document.

The base AM and PM peak hour intersection turning movement volumes collected by the NHDOT at 19 study area intersections in 2016 were adjusted to develop base year 2015 volumes to be consistent with the base year of the SNHPC model. The SNHPC model is able to provide AWDTs at intersections by using the node and the intersecting links to create a series of 'From Link->Through Node> To Link' paths to simulate the allowed turning movement volumes at any particular node on a daily basis, including new intersections that will be created under some of the Exit 4A alternatives. This intersection-level information from the model was provided by SNHPC for all alternatives and was used as guidance to develop turning movement volume estimates for the 2040 No-Build and Build conditions for design and analysis purposes.

Basic Procedure

A separate spreadsheet was developed for each alternative that included all the intersections to be analyzed for that alternative. The 2015 base AM and PM peak hour turning movement volumes for each approach were inserted, along with the corresponding From Link>Thru Node>To Link volumes representing each turning movement for that scenario. The total approach volume was

calculated for each peak hour, as well as the existing percentage of the total volume represented by each turning movement on that approach. This was then compared to the model-provided AWDT for each of these movements, as well as the percent of the total approach AWDT from the model that each of these movements represented.

It should be noted that some of the movements on any intersection approach may not have a corresponding model link associated with it, since the model does not include every minor street or driveway in its network. In these cases, the existing counted volumes were either perpetuated or adjusted to reflect a reasonable growth rate, depending on the characteristics of that particular approach and/or movement.

Intersection-level AWDTs were then provided for each alternative, and the percentage of the total approach AWDT for each movement calculated again for that alternative. The total AWDT for that approach was compared to the 2015 model results, and the ratio between the two was calculated. This ratio was then applied to the total 2015 peak hour volume on that approach to derive the peak hour volume for that approach. If the ratio was greater than 1.0, the total approach volume was increased proportionately, and vice versa.

Since the model volumes should reflect changes in traffic distribution associated with the alternative being analyzed, the change in the percentage of the AWDT for each movement should be indicative of how turning movements at any intersection would be affected by an Exit 4A interchange alternative being added to the network. As such, the ratio comparing the turn percentage for an alternative to the base 2015 model was calculated on an AWDT basis. This turn percentage ratio was then multiplied by the existing turn percentages as reflected in the 2015 traffic counts on each approach. In some cases, this ratio may be greater than 1.0, indicating that movement should now represent a higher percentage of the total approach movements than exhibited in the 2015 base condition. At no time should the sum of the adjusted turn percentages be greater than 1.0, so in some cases engineering judgment was applied to make one of the movements (usually the highest percentage one, but not always) balance the approach so that the total turn percentages were equal to 1.0.

There were also other individual manual adjustments made to balance volumes between adjacent intersections where there should be little, if any, differences in directional volumes, such as between Ross' Corner (Crystal Avenue, Folsom Road and Tsienneto Road) and the Tsienneto/Pinkerton Street intersection. Resulting peak hour volumes at an intersection were also compared to model-projected volumes on adjacent links as a reasonableness test. Traffic volumes directly added to the network from zone connections in the vicinity of these intersections were also evaluated to determine if any differences between intersections could be attributed to the traffic heading to and from these zones, based on an assumed AM peak/PM peak split of 7% and 9% of AWDT, respectively, as reflected in the actual field counts.

Other Adjustments

One notable traffic distribution challenge was discovered under Alternative A. The SNHPC model showed a larger than expected increase in westbound AWDT for the right turn movement from NH 102 to Crystal Avenue northbound, then a left turn at Rollins Street, followed by a right turn onto Franklin Street. This resulted in a substantial increase in left turns from Franklin Street onto North

High Street, which appeared to be an unreasonable path given the existing characteristics of Franklin Street. At our request, SNHPC performed a 'trace' of the path of westbound trips that were on the NH 102 link just east of Crystal Avenue that were destined for the Franklin/North High Street intersection. The attached graphics show the eastbound and westbound traces for the 2015, 2040 No-Build and 2040 Alternative A scenarios.

This trace found that a large number of trips from both East Derry Road and the traffic zone serving the Pinkerton Street area north of NH 102 were being directed along this path. These trips were manually redistributed to the NH 102/NH 28 Bypass traffic circle and to Pinkerton Street directly to adjust to what was considered a more reasonable path between these locations.

This basic procedure will be used for all alternatives to develop 2040 AM and PM peak hour intersection volumes for analysis purposes. Other alternative-specific adjustments may also be needed at certain locations based on the model-generated AWDT intersection assignments as we proceed further.

PK:LCG:ams

Attachments

- Alternative A intersection volume spreadsheet
- Alternative A – 2040 AM and PM peak hour intersection volumes - final
- SNHPC trace for westbound trips to Franklin Street (2015, 2040 No-Build, 2040 Alt A)

#5 **NH 102 at Londonderry Road**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 exist Model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
3556	791	3251	EB Left	75	12.5%	638	6.0%	515	6.0%	0.99	12.3%	60	515	523	1105	1083	1569	2136
		792	EB Thru	520	86.7%	9915	94.0%	8111	94.0%	1.00	87.7%	430	8111	7748	8555	9509	14981	13168
			EB Right	5	0.8%	0	0.0%	0	0.0%	#DIV/0!	0.0%	0	0	0	0	0	0	0
				600		10553		8626		0.817	1	490	8626	8271	9660	10592	16550	15304
792	791		WB Left	5	0.4%	0	0.0%	0	0.0%	-	0.4%	5	0	0	0	0	0	0
		3556	WB Thru	1090	97.3%	9567	83.0%	6688	67.5%	0.81	97.3%	930	6688	8105	7803	8660	15931	15412
		3251	WB Right	25	2.2%	1959	17.0%	3221	32.5%	1.91	2.2%	20	3221	2764	3132	3070	464	449
				1120		11526		9909		0.860	1	960	9909	10869	10935	11730	16395	15861
None			NB Left	0	0.0%	0	#DIV/0!	0	#DIV/0!	-	0.0%	#DIV/0!	0	0	0	0	0	0
			NB Thru	0	0.0%	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0.0%	#DIV/0!	0	0	0	0	0	0
			NB Right	1	100.0%	0	#DIV/0!	0	#DIV/0!	#DIV/0!	100.0%	#DIV/0!	0	0	0	0	0	0
				1		0		0		#DIV/0!	1	#DIV/0!	0	0	0	0	0	0
3251	791	792	SB Left	10	8.7%	1543	71.9%	2394	85.5%	1.19	52.7%	80	2394	2465	2170	1975	1143	875
			SB Thru	0	0.0%	0	0.0%	0	0.0%	1.00	0.0%	0	0	0	0	0	0	0
		3556	SB Right	105	91.3%	602	28.1%	407	14.5%	0.52	47.3%	70	407	556	1226	1225	1345	1364
				115		2145		2801		1.306	1	150	2801	3021	3396	3200	2488	2239

#5 **NH 102 at Londonderry Road**

PM Traffic

	Adjusted 2015	Exist Turn %	2015 exist Model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
EB Left	285	21.0%	638	6.0%	515	6.0%	0.99	20.8%	210	515	523	1105	1083	1569	2136
EB Thru	950	70.1%	9915	94.0%	8111	94.0%	1.00	79.2%	880	8111	7748	8555	9509	14981	13168
EB Right	120	8.9%	0	0.0%	0	0.0%	#DIV/0!	0.0%	120	0	0	0	0	0	0
	1355		10553		8626		0.817	1	1110	8626	8271	9660	10592	16550	15304
WB Left	5	0.7%	0	0.0%	0	0.0%	-	0.7%	5	0	0	0	0	0	0
WB Thru	720	94.7%	9567	83.0%	6688	67.5%	0.81	77.0%	500	6688	8105	7803	8660	15931	15412
WB Right	35	4.6%	1959	17.0%	3221	32.5%	1.91	22.3%	140	3221	2764	3132	3070	464	449
	760		11526		9909		0.860	1	650	9909	10869	10935	11730	16395	15861
NB Left	5	50.0%	0	#DIV/0!	0	#DIV/0!	-	50.0%	10	0	0	0	0	0	0
NB Thru	0	0.0%	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0.0%	0	0	0	0	0	0	0
NB Right	5	50.0%	0	#DIV/0!	0	#DIV/0!	#DIV/0!	50.0%	10	0	0	0	0	0	0
	10		0		0		#DIV/0!	1	10	0	0	0	0	0	0
SB Left	10	6.9%	1543	71.9%	2394	85.5%	1.19	53.6%	100	2394	2465	2170	1975	1143	875
SB Thru	5	3.4%	0	0.0%	0	0.0%	#DIV/0!	0.0%	5	0	0	0	0	0	0
SB Right	130	89.7%	602	28.1%	407	14.5%	0.52	46.4%	90	407	556	1226	1225	1345	1364
	145		2145		2801		1.306	1	190	2801	3021	3396	3200	2488	2239

Percetage adjusted manually to add to 100% on approach

Existing percentages or volumes carried forward

#6 **NH 102 at Fordway/High**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
1868	1869	2128	EB Left	0	0.0%	0	0.0%	0	0.0%	#DIV/0!	0.0%	0	0	0	0	0	0	0
		1870	EB Thru	400	76.2%	9909	86.8%	9173	87.3%	1.01	77.1%	370	9173	8916	9394	10147	13316	11221
		2138	EB Right	125	23.8%	1501	13.2%	1331	12.7%	0.96	22.9%	110	1331	1297	1331	1333	2257	2165
				525		11410		10504		0.921	1	480	10504	10213	10725	11480	15573	13386
1870	1869	2138	WB Left	15	2.5%	771	8.7%	220	2.9%	0.34	0.8%	15	220	273	607	847	162	165
		1868	WB Thru	595	97.5%	8089	91.3%	7252	97.1%	1.06	99.2%	495	7252	7969	7404	8193	11666	10773
		2128	WB Right	0	0.0%	0	0.0%	0	0.0%	#DIV/0!	0.0%	0	0	0	0	0	0	0
				610		8860		7472		0.843	1	510	7472	8242	8011	9040	11828	10938
2138	1869	1868	NB Left	345	83.1%	1681	60.0%	2024	71.1%	1.18	87.8%	370	2024	1971	2129	2122	2059	1674
		2128	NB Thru	0	0.0%	0	0.0%	0	0.0%	-	0.0%	0	0	0	0	0	0	0
		1870	NB Right	70	16.9%	1121	40.0%	824	28.9%	0.72	12.2%	50	824	676	585	433	556	575
				415		2802		2848		1.016417	1	420	2848	2647	2714	2555	2615	2249
2128	1869	1870	SB Left	5	12.5%	234	28.4%	246	15.7%	0.55	6.9%	10	246	231	266	262	97	99
		2138	SB Thru	25	62.5%	570	69.2%	1316	84.3%	1.22	86.1%	70	1316	925	238	331	329	365
		1868	SB Right	10	25.0%	20	2.4%	0	0.0%	-	6.9%	10	0	0	0	0	4	9
				40		824		1562		1.896	1	80	1562	1156	504	593	430	473

#6 **NH 102 at Fordway/High**

PM Traffic

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
EB Left	0	0.0%	0	0.0%	0	0.0%	#DIV/0!	0.0%	0	0	0	0	0	0	0
EB Thru	760	83.5%	9909	86.8%	9173	87.3%	1.01	84.1%	710	9173	8916	9394	10147	13316	11221
EB Right	150	16.5%	1501	13.2%	1331	12.7%	0.96	15.9%	130	1331	1297	1331	1333	2257	2165
	910		11410		10504		0.921	1	840	10504	10213	10725	11480	15573	13386
WB Left	15	3.5%	771	8.7%	220	2.9%	0.34	1.2%	15	220	273	607	847	162	165
WB Thru	415	96.5%	8089	91.3%	7252	97.1%	1.06	98.8%	345	7252	7969	7404	8193	11666	10773
WB Right	0	0.0%	0	0.0%	0	0.0%	#DIV/0!	0.0%	0	0	0	0	0	0	0
	430		8860		7472		0.843	1	360	7472	8242	8011	9040	11828	10938
NB Left	230	69.7%	1681	60.0%	2024	71.1%	1.18	78.1%	270	2024	1971	2129	2122	2059	1674
NB Thru	0	0.0%	0	0.0%	0	0.0%	#DIV/0!	0.0%	0	0	0	0	0	0	0
NB Right	100	30.3%	1121	40.0%	824	28.9%	0.72	21.9%	70	824	676	585	433	556	575
	330		2802		2848		1.016	1	340	2848	2647	2714	2555	2615	2249
SB Left	15	21.4%	234	28.4%	246	15.7%	0.55	11.9%	20	246	231	266	262	97	99
SB Thru	50	71.4%	570	69.2%	1316	84.3%	1.22	88.1%	110	1316	925	238	331	329	365
SB Right	5	7.1%	20	2.4%	0	0.0%	-	0.0%	5	0	0	0	0	4	9
	70		824		1562		1.896	1	130	1562	1156	504	593	430	473

Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward

#7 **NH 102 at NH 28**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model	
1875	1859	1860	EB Left	105	28.4%	2405	27.1%	375	4.3%	0.16	4.5%	20	375	1565	1348	1792	3054	1799	
		1876	EB Thru	205	55.4%	4357	49.2%	5768	65.6%	1.33	74.9%	280	5768	3920	3358	4339	5751	5008	
		3534	EB Right	60	16.2%	2100	23.7%	2647	30.1%	1.27	20.6%	80	2647	2815	2862	2791	3882	3150	
				370		8862		8790		0.992	1	370	8790	8300	7568	8922	12687	9957	
1876	1859	3534	WB Left	35	7.0%	1298	24.4%	771	11.9%	0.49	3.4%	20	771	847	834	859	1255	1222	
		1875	WB Thru	385	77.0%	3928	74.0%	4383	67.7%	0.91	70.4%	430	4383	3454	4156	5280	5144	5297	
		1860	WB Right	80	16.0%	84	1.6%	1322.25	20.4%	12.91	26.1%	160	3075	1564	144	198	1483	1269	
				500		5310		6476.25		1.220	1	610	8229	5865	5134	6337	7882	7788	
3534	1859	1875	NB Left	60	16.7%	2775	33.5%	4982	58.2%	1.74	46.5%	170	4982	4502	3174	3158	4832	4065	
		1860	NB Thru	260	72.2%	4129	49.9%	2810	32.8%	0.66	47.5%	180	2810	3102	4277	4515	1567	2545	
		1876	NB Right	40	11.1%	1372	16.6%	765	8.9%	0.54	6.0%	20	765	808	775	982	1217	1376	
				360		8276		8557		1.034	1	370	8557	8412	8226	8655	7616	7986	
1860	1859	1876	SB Left	70	17.3%	89	1.3%	681	11.3%	8.51	25.4%	90	681	551	702	227	980	731	0.10279
		3534	SB Thru	230	56.8%	4520	67.4%	4817	79.9%	1.19	67.3%	240	4817	4558	4701	4840	2009	2409	
		1875	SB Right	105	25.9%	2093	31.2%	529	8.8%	0.28	7.3%	30	529	299	805	593	2474	2247	
				405		6702		6027		0.899	1	360	6027	5408	6208	5660	5463	5387	

#7 **NH 102 at NH 28**

PM Traffic

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
EB Left	135	23.1%	2405	27.1%	375	4.3%	0.16	3.6%	20	375	1565	1348	1792	3054	1799
EB Thru	410	70.1%	4357	49.2%	5768	65.6%	1.33	89.6%	520	5768	3920	3358	4339	5751	5008
EB Right	40	6.8%	2100	23.7%	2647	30.1%	1.27	6.8%	40	2647	2815	2862	2791	3882	3150
	585		8862		8790		0.992	1	580	8790	8300	7568	8922	12687	9957
WB Left	75	19.2%	1298	24.4%	771	11.9%	0.49	9.4%	60	771	847	834	859	1255	1222
WB Thru	250	64.1%	3928	74.0%	4383	67.7%	0.91	58.6%	360	4383	3454	4156	5280	5144	5297
WB Right	65	16.7%	84	1.6%	1322.25	20.4%	12.91	32.0%	200	3075	1564	144	198	1483	1269
	390		5310		6476.25		1.220	1	480	8229	5865	5134	6337	7882	7788
NB Left	70	17.5%	2775	33.5%	4982	58.2%	1.74	46.7%	170	4982	4502	3174	3158	4832	4065
NB Thru	295	73.8%	4129	49.9%	2810	32.8%	0.66	48.5%	180	2810	3102	4277	4515	1567	2545
NB Right	35	8.8%	1372	16.6%	765	8.9%	0.54	4.7%	20	765	808	775	982	1217	1376
	400		8276		8557		1.034	1	410	8557	8412	8226	8655	7616	7986
SB Left	135	21.6%	89	1.3%	681	11.3%	8.51	21.6%	80	681	551	702	227	980	731
SB Thru	340	54.4%	4520	67.4%	4817	79.9%	1.19	71.7%	260	4817	4558	4701	4840	2009	2409
SB Right	150	24.0%	2093	31.2%	529	8.8%	0.28	6.7%	20	529	299	805	593	2474	2247
	625		6702		6027		0.899	1	560	6027	5408	6208	5660	5463	5387

Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward
Adjusted WB RT volume to divert excess trips destined for Franklin via Rollins (43% of total trips)

#8 **N High St/ Ash St Extension**

AM Traffic

Nodes From	Thru	To	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
2125	3485	2124		EB Left	180	94.7%	1654	100.0%	2217	100.0%	1.00	94.7%	240	2217	1875	3213	3387	3746	4501
				EB Thru	0	0.0%	0	0.0%	0	0.0%	-	0.0%	0						0
		2123		EB Right	10	5.3%	0	0.0%	0	0.0%	1.00	5.3%	10	0	0	0	0	0	0
					190		1654		2217		1.340	1	250						4501
None	3485			WB Left	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0.0%	0						0
				WB Thru	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0.0%	0						0
				WB Right	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	#DIV/0!	0.0%	0						0
					0		0		0		#DIV/0!	0	0						0
2123	3485	2125	133	NB Left	5	3.8%	0	0.0%	0	0.0%	1.00	3.8%	5	0	0	0	0	0	0
		2124		NB Thru	125	96.2%	1630	100.0%	3167	100.0%	1.00	96.2%	240	3167	601	1604	1014	678	1110
				NB Right	0	0.0%	0	0.0%		0.0%	1.00	0.0%	0						0
					130		1630		3167		1.943	1	250						1110
2124	3485			SB Left	0	0.0%	0	0.0%	0	0.0%	#DIV/0!	0.0%	0						0
		2123		SB Thru	175	43.2%	1464	38.2%	2317	54.2%	1.42	57.9%	260	2317	1432	570	664	1045	1461
		2125		SB Right	230	56.8%	2366	61.8%	1961	45.8%	0.74	42.1%	190	1961	1832	3315	2618	4026	4049
					405		3830		4278		1.117	1	450						5510

Notes:

133=Zone Centroid

2123 to 133 = 143, 2124 to 133 = 139, 2125 to 133 = 59
133 to 2123 =164, to 2124=124, to 2125 = 52

#8 **N High St/ Ash St Extension**

PM Traffic

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
EB Left	420	98.8%	1654	100.0%	2217	100.0%	1.00	98.8%	560	2217	1875	3213	3387	3746	4501
EB Thru	0	0.0%	0	0.0%	0	0.0%	1.00	0.0%	0	0	0	0	0	0	0
EB Right	5	1.2%	0	0.0%	0	0.0%	1.00	1.2%	10	0	0	0	0	0	0
	425		1654		2217		1.340	1	570						4501
WB Left	0	#DIV/0!	0	#DIV/0!	0	0.0%	-	0.0%	0	0	0	0	0	0	0
WB Thru	0	#DIV/0!	0	#DIV/0!	0	0.0%	-	0.0%	0	0	0	0	0	0	0
WB Right	0	#DIV/0!	0	#DIV/0!	0	0.0%	-	0.0%	0	0	0	0	0	0	0
	0		0				0.000	0	0						0
NB Left	5	1.7%	0	0.0%	0	0.0%	1.00	1.7%	5	0	0	0	0	0	0
NB Thru	290	98.3%	1630	100.0%	3167	100.0%	1.00	98.3%	555	3167	601	1604	1014	678	1110
NB Right	0	0.0%	0	0.0%	0	0.0%	1.00	0.0%	0	0	0	0	0	0	0
	295		1630		3167		1.943	1	570						1110
SB Left	0	0.0%	0	0.0%	0	0.0%	#DIV/0!	0.0%	0	0	0	0	0	0	0
SB Thru	170	39.1%	1464	38.2%	2317	54.2%	1.42	54.8%	270	2317	1432	570	664	1045	1461
SB Right	265	60.9%	2366	61.8%	1961	45.8%	0.74	45.2%	220	1961	1832	3315	2618	4026	4049
	435		3830		4278		1.117	1	490						5510

Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward

#9 **N High St/ Madden Road**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	NOT USED 2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
377	2124	2106	EB Left	10	100.0%	149	60.8%	0	#DIV/0!	#DIV/0!	100.0%	0		117	146	146	100	100
			EB Thru	0	0.0%	0	0.0%	0	#DIV/0!	1.00	0	0						0
		3485	EB Right	0	0.0%	96	39.2%	0	#DIV/0!	#DIV/0!	0	0		57	85	85	131	131
				10		245		0		0.000	1	0						231
None			WB Left	0	0.0%	0	0.0%	0	0.0%	1.00	0	0						0
			WB Thru	0	0.0%	0	0.0%	0	0.0%	1.00	0	0						0
			WB Right	0	0.0%	0	0.0%	0	0.0%	1.00	0	0						0
				0		0		0		0.000	0	0						0
3485	2124	377	NB Left	0	0.0%	92	2.7%	0	#DIV/0!	-	0.0%	0		85	87	87	121	129
		2106	NB Thru	310	100.0%	3316	97.3%	0	#DIV/0!	1.00	100.0%	0		2758	4901	4486	4376	5557
			NB Right	0	0.0%	0	0.0%	0	#DIV/0!	-	0.0%	0						0
				310		3408		0		0.000	1	0						5686
2106	2124		SB Left	0	0.0%	0	0.0%	0	#DIV/0!	#DIV/0!	0.0%	0						0
		3485	SB Thru	400	95.2%	3873	96.2%	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		3468	3967	3366	5003	5488
		377	SB Right	20	4.8%	153	3.8%	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		112	144	144	110	102
				420		4026		0		0.000	#DIV/0!	0						5590

Notes: 377 is zone centroid for Madden Rd

#9 **N High St/ Madden Road**

PM Traffic

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	NOT USED 2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
EB Left	10	100.0%	149	60.8%	0	#DIV/0!	#DIV/0!	100.0%	0	0	117	146	146	100	100
EB Thru	0	0.0%	0	0.0%	0	#DIV/0!	1.00	0	0	0	0	0	0	0	0
EB Right	0	0.0%	96	39.2%	0	#DIV/0!	#DIV/0!	0	0	0	57	85	85	131	131
	10		245		0		0.000	1	0						231
WB Left	0	0.0%	0	0.0%	0	0.0%	1.00	0	0	0	0	0	0	0	0
WB Thru	0	0.0%	0	0.0%	0	0.0%	1.00	0	0	0	0	0	0	0	0
WB Right	0	0.0%	0	0.0%	0	0.0%	1.00	0	0	0	0	0	0	0	0
	0		0		0		0.000	0	0						0
NB Left	0	0.0%	92	2.7%	0	#DIV/0!	#DIV/0!	0.0%	0	0	85	87	87	121	129
NB Thru	700	100.0%	3316	97.3%	0	#DIV/0!	1.00	100.0%	0	0	2758	4901	4486	4376	5557
NB Right	0	0.0%	0	0.0%	0	#DIV/0!	#DIV/0!	0.0%	0	0	0	0	0	0	0
	700		3408		0		0.000	1	0						5686
SB Left	0	0.0%	0	0.0%	0	#DIV/0!	#DIV/0!	0.0%	0	0	0	0	0	0	0
SB Thru	440	97.8%	3873	96.2%	0	#DIV/0!	1.00	#DIV/0!	#DIV/0!	0	3468	3967	3366	5003	5488
SB Right	10	2.2%	153	3.8%	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	112	144	144	110	102
	450		4026		0		0.000	#DIV/0!	0						5590

Percetage adjusted manually to add to 100% on approach

Existing percentages or volumes carried forward

#9A **N High St/Connector Road**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	2015 ex Model	2040 NBld Model	2040 NBld Turn	2040 Alt A Model	2040 Alt A Turn	Est AM Peak as 7% of ADT	Manual Alt A Adjustments	Comments	2040 Alt B Turn	2040 Alt C Model	2040 Alt C Turn	2040 Alt D Model	2040 Alt D Turn	2040 Alt F Model	2040 Alt F Turn
6531	2124		EB Left				#DIV/0!	0	0.0%	-			#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
		2106	EB Thru				#DIV/0!	18553	88.4%	1,670	1090		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
		3485	EB Right				#DIV/0!	2429	11.6%	220	270		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
								20982		1890									
2106	2124	3485	WB Left				#DIV/0!	2095	11.6%	150	180		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
		6531	WB Thru				#DIV/0!	15953	88.4%	1,110	1110		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
			WB Right				#DIV/0!	0	0.0%	-			#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
								18048		1260									
3485	2124	6531	NB Left				#DIV/0!	3301	58.0%	230	280		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
			NB Thru				#DIV/0!	0	0.0%	-			#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
		2106	NB Right				#DIV/0!	2393	42.0%	170	200		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
								5694		400	480	Balance to Ash St Ext							
None			SB Left				#DIV/0!	0	#DIV/0!				#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
			SB Thru				#DIV/0!	0	#DIV/0!				#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
			SB Right				#DIV/0!	0	#DIV/0!				#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
								0		0									

#9A **N High St/Connector Road**

PM Traffic

	4:30 PM Adjusted 2015	2015 ex Model	2040 NBld Model	2040 NBld Turn	2040 Alt A Model	2040 Alt A Turn	PM Peak as 9% of ADT			2040 Alt B Turn	2040 Alt C Model	2040 Alt C Turn	2040 Alt D Model	2040 Alt D Turn	2040 Alt F Model	2040 Alt F Turn
EB Left	10	0	0	#DIV/0!	0	0.0%	-			#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!
EB Thru	0	0	0	#DIV/0!	18553	88.4%	1,670			#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!
EB Right	0	0	0	#DIV/0!	2429	11.6%	220	220	262.9268293	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!
					20982		1890									
WB Left	0	0	0	#DIV/0!	2095	11.6%	190			#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!
WB Thru	0	0	0	#DIV/0!	15953	88.4%	1,430			#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!
WB Right	0	0	0	#DIV/0!	0	0.0%	-	190	227.0731707	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!
					18048		1620	410	490							
NB Left	0	0	0	#DIV/0!	3301	58.0%	300	660	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!
NB Thru	700	700	0	0	0	0.0%	-		0	0	0	0	0	0	0	0
NB Right	0	0	0	#DIV/0!	2393	42.0%	210	460	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!
					5694		510	1115	Balance to Ash St Ext							
SB Left	0	0	0	#DIV/0!	0	#DIV/0!			0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!
SB Thru	440	440	0	0	0	#DIV/0!			0	0	0	0	0	0	0	0
SB Right	10	10	0	0	0	#DIV/0!			0	0	0	0	0	0	0	0
					0											

#10 **Folsom Rd at Franklin St**

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	AM Traffic 2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model	Manual Alt A Adjustments	
2124	2106	3484	EB Left	35	11.3%	470	13.6%	764	3.6%	0.27	3.0%	60	764	627	537	530	557	546		
		3483	EB Thru	270	87.1%	2958	85.4%	18004	85.5%	1.00	95.4%	1790	18004	2206	4484	4076	3892	5083	1200	-590
		2113	EB Right	5	1.6%	37	1.1%	2301	10.9%	1.00	1.6%	30	2301	41	26	26	27	28		
				310		3465		21069		6.081	1	1880						5657		
3483	2106	2113	WB Left	30	7.1%	1	0.0%	0	0.0%	-	3.0%	50	0	4	0	0	0	0		
		2124	WB Thru	385	90.6%	3535	100.0%	13719	100.0%	1.00	94.6%	1560	13719	2059	3012	2499	4261	4518	1100	-460
		3484	WB Right	10	2.4%	0	0.0%	0	0.0%	1.00	2.4%	40		974	21	37	39	39		
				425		3536		13719		3.880	1	1650						4557		
2113	2106	2124	NB Left	10	20.0%	43	14.1%	1307	99.7%	7.09	70.0%	150	3844	58	32	33	35	35		
		3484	NB Thru	5	10.0%	259	84.6%	4	0.3%	1.00	10.0%	20	4	620	188	194	242	244		
		3483	NB Right	35	70.0%	4	1.3%	0	0.0%	1.00	20.0%	40	0	100	1	1	1	2		
				50		306		1310.96		4.284	1	210						281		
3484	2106	3483	SB Left	10	22.2%	0	0.0%	0	0.0%	1.00	22.0%	5		700	150	141	64	67		
		2113	SB Thru	5	11.1%	77	14.7%	3	0.5%	0.03	0.4%	5	3	324	121	138	63	67		
		2124	SB Right	30	66.7%	448	85.3%	596	99.5%	1.17	77.6%	40	596	1462	1067	978	817	996		
				45		525		599		1.141	1	50						1130		

#10 **Folsom Rd at Franklin St**

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A Model	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model	Manual Alt A Adjustments	
EB Left	45	6.3%	470	13.6%	764	3.6%	0.27	1.7%	70	764	627	537	530	557	546		
EB Thru	665	93.0%	2958	85.4%	18004	85.5%	1.00	97.6%	4250	18004	2206	4484	4076	3892	5083	2075	-2175
EB Right	5	0.7%	37	1.1%	2301	10.9%	1.00	0.7%	30	2301	41	26	26	27	28		
	715		3465		21069		6.081	1	4350						5657		
WB Left	30	7.1%	1	0.0%	0	0.0%	1.00	7.1%	120	0	4	0	0	0	0		
WB Thru	375	88.2%	3535	100.0%	13719	100.0%	1.00	88.2%	1460	13719	2059	3012	2499	4261	4518	960	250
WB Right	20	4.7%	0	0.0%	0	0.0%	1.00	4.7%	80	0	974	21	37	39	39		
	425		3536		13719		3.880	1	1650						4557		
NB Left	5	7.7%	43	14.1%	1307	99.7%	7.09	70.0%	200	3844	58	32	33	35	35		
NB Thru	10	15.4%	259	84.6%	4	0.3%	0.00	10.0%	30	4	620	188	194	242	244		
NB Right	50	76.9%	4	1.3%	0	0.0%	-	20.0%	60	0	100	1	1	1	2		
	65		306		1310.96		4.284	1	280						281		
SB Left	20	20.0%	0	0.0%	0	0.0%	1.00	20.0%	20	0	700	150	141	64	67		
SB Thru	10	10.0%	77	14.7%	3	0.5%	0.03	0.3%	10	3	324	121	138	63	67		
SB Right	70	70.0%	448	85.3%	596	99.5%	1.17	79.7%	90	596	1462	1067	978	817	996		
	100		525		599		1.141	1	110						1130		

Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward
Adjusted NB LT volume to divert excess trips destined for Franklin via Rollins and Rt 102 WB onto Crystal (34% of total)

#11 **Ross' Corner (Folsom/Tsienneto at NH 28/Crystal)**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model	Manual Alt A Adjustments
3483	1863	1864	EB Left	135	41.5%	1215	26.5%	1139	6.5%	0.24	10.2%	130	1139	13	1780	1518	768	582	
		2107	EB Thru	170	52.3%	3242	70.8%	15176	86.5%	1.22	63.9%	800	15176	2671	4489	4351	4100	5269	820
		1862	EB Right	20	6.2%	123	2.7%	1228	7.0%	2.61	25.9%	320	1228	0	0	0	0	0	
				325		4580		17543		3.830	1	1245						5851	
2107	1863	1862	WB Left	125	15.9%	1495	14.6%	385	2.8%	0.20	3.1%	30	385	427	509	348	1693	1629	
		3483	WB Thru	290	36.9%	2578	25.1%	9700	71.7%	2.85	77.0%	800	9700	1965	3171	2746	4354	4686	935
		1864	WB Right	370	47.1%	6179	60.3%	3444	25.5%	0.42	19.9%	210	3444	8568	8302	12265	5564	4901	220
				785		10252		13529		1.320	1	1040						11216	
1862	1863	3483	NB Left	20	5.2%	0	0.0%	1627	44.3%	1.50	47.8%	100	1627	81	0	0	0	0	
		1864	NB Thru	230	59.7%	4742	70.0%	1495	40.7%	0.58	34.7%	70	1495	4035	4496	4547	2411	3115	
		2107	NB Right	135	35.1%	2028	30.0%	548	14.9%	0.50	17.5%	40	548	1510	1569	2144	2901	1831	
				385		6770		3670		0.542	1	210						4946	
1864	1863	2107	SB Left	310	45.9%	5682	45.4%	567	17.4%	1.50	29.8%	50	567	7758	7168	8224	5165	5388	
		1862	SB Thru	220	32.6%	5019	40.1%	1959	59.9%	1.49	48.7%	100	1959	4512	6154	6186	3308	3644	
		3483	SB Right	145	21.5%	1803	14.4%	742	22.7%	1.00	21.5%	50	742	0	54	31	0	0	
				675		12504		3268		0.261	1	180						9032	

#11 **Ross' Corner (Folsom/Tsienneto at NH 28/Crystal)**

PM Traffic (rev per new TMC)

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model		
EB Left	240	36.9%	1215	26.5%	1139	6.5%	0.24	9.0%	230	1139	13	1780	1518	768	582		
EB Thru	320	49.2%	3242	70.8%	15176	86.5%	1.22	77.1%	1920	15176	2671	4489	4351	4100	5269	1380	
EB Right	90	13.8%	123	2.7%	1228	7.0%	1.00	13.8%	340	1228	0	0	0	0	0		
	650		4580		17543		3.830	1	2490						5851		
WB Left	150	20.0%	1495	14.6%	385	2.8%	0.20	3.9%	40	385	427	509	348	1693	1629	44.44444	45
WB Thru	220	29.3%	2578	25.1%	9700	71.7%	2.85	74.7%	740	9700	1965	3171	2746	4354	4686	822.2222	820
WB Right	380	50.7%	6179	60.3%	3444	25.5%	0.42	21.4%	210	3444	8568	8302	12265	5564	4901	233.3333	235
	750		10252		13529		1.320	1	990						11216	1100	
NB Left	80	13.6%	0	0.0%	1627	44.3%	0.90	12.2%	40	1627	81	0	0	0	0		
NB Thru	360	61.0%	4742	70.0%	1495	40.7%	0.58	75.1%	240	1495	4035	4496	4547	2411	3115		
NB Right	150	25.4%	2028	30.0%	548	14.9%	0.50	12.7%	40	548	1510	1569	2144	2901	1831		
	590		6770		3670		0.542	1	320						4946		
SB Left	520	45.6%	5682	45.4%	567	17.4%	0.38	17.4%	50	567	7758	7168	8224	5165	5388		
SB Thru	430	37.7%	5019	40.1%	1959	59.9%	1.49	65.9%	200	1959	4512	6154	6186	3308	3644		
SB Right	190	16.7%	1803	14.4%	742	22.7%	1.00	16.7%	50	742	0	54	31	0	0		
	1140		12504		3268		0.261	1	300						9032		

Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward
Manual adjustment to balance to Pinkerton intx

#12 **Tsienneto Rd at Pinkerton St**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model	Manual Alt A Adjustments	
1863	2107	2108	EB Thru	370	60.2%	5732	52.3%	9325	57.2%	1.09	64.3%	580	9325	5372	6699	7959	7499	7778		
		2109	EB Right	245	39.8%	5220	47.7%	6966	42.8%	0.90	35.7%	330	6966	6431	6527	6761	4667	4710		
				615		10952		16291		1.487	1.00	910						12488		
2108	2107	2109	WB Left	80	12.3%	159	2.1%	106	0.9%	0.42	5.2%	50	106	111	126	124	131	131		
		1863	WB Thru	570	87.7%	7582	97.9%	12168	99.1%	1.01	94.8%	980	12168	8817	8159	11297	10700	10314		
				650		7741		12274		1.586	1.00	1030						10445		
2109	2107	1863	NB Left	215	72.9%	2670	78.6%	1361	68.5%	0.87	63.5%	110	1361	2116	3824	4062	911	902	205	95
		2108	NB Right	80	27.1%	728	21.4%	626	31.5%	1.47	36.5%	60	626	655	660	661	646	653		
				295		3398		1987		0.585	1.00	170						1555		

Base volumes balanced to match Ross' Corner data

#12 **Tsienneto Rd at Pinkerton St**

PM Traffic

4:30 PM

	Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model	Manual Alt A Adjustments	
EB Thru	580	58.6%	5732	52.3%	9325	57.2%	1.09	62.8%	920	9325	5372	6699	7959	7499	7778		
EB Right	410	41.4%	5220	47.7%	6966	42.8%	0.90	37.2%	550	6966	6431	6527	6761	4667	4710		
	990		10952		16291		1.487	1.00	1470						12488		
WB Left	115	16.8%	159	2.1%	106	0.9%	0.42	7.1%	80	106	111	126	124	131	131		
WB Thru	570	83.2%	7582	97.9%	12168	99.1%	1.01	92.9%	1010	12168	8817	8159	11297	10700	10314		
	685		7741		12274		1.586	1.00	1090						10445		
NB Left	180	60.0%	2670	78.6%	1361	68.5%	0.87	52.3%	90	1361	2116	3824	4062	911	902	115	
NB Right	120	40.0%	728	21.4%	626	31.5%	1.47	47.7%	90	626	655	660	661	646	653		
	300		3398		1987		0.585	1.00	180						1555		

Base volumes balanced to match Ross' Corner data

Percentage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward
Adjusted NB LT volume to divert excess trips destined for Franklin via Rollins and Rt 102 WB onto Crystal (34% of total)

#13 **NH 28 at Linlew Dr**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	2015 existing model % ADT	2040 Alt A ADT	2040 Alt A % ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
None	1865		EB Left	5	50.0%	0	#DIV/0!	0	#DIV/0!	1.00	50.0%	5	0	0	0	0	0	0
			EB Thru	0	0.0%	0	#DIV/0!	0	#DIV/0!	1.00	0.0%	0	0	0	0	0	0	0
			EB Right	5	50.0%	0	#DIV/0!	0	#DIV/0!	1.00	50.0%	5	0	0	0	0	0	0
				10		0		0		1.000	1	10						0
2100	1865	1864	WB Left	50	16.9%	1319	98.0%	437	47.0%	0.48	8.1%	20	437	262	213	418	618	710
			WB Thru	0	0.0%	0	0.0%	0	0.0%	1.00	0.0%	0	0	0	0	0	0	0
		1866	WB Right	245	83.1%	27	2.0%	493	53.0%	26.43	91.9%	180	493	86	0	478	77	44
				295		1346		930		0.691	1	200						754
1864	1865		NB Left	0	0.0%	0	0.0%	0	0.0%	1.00	0.0%	0	0	0	0	0	0	0
		1866	NB Thru	655	95.6%	12136	100.0%	6017	99.0%	1.00	95.6%	330	6017	12591	14578	18330	8743	8598
		2100	NB Right	30	4.4%	1	0.0%	61	1.0%	121.81	4.4%	10	61	0	0	0	1	1
				685		12137		6078		0.501	1	340						8599
1866	1865	2100	SB Left	50	6.0%	790	6.2%	810	21.0%	1.00	6.0%	20	810	208	427	2384	878	693
		1864	SB Thru	790	94.0%	11898	93.8%	3055	79.0%	1.00	94.0%	240	3055	11940	13963	14812	8462	8943
			SB Right	0	0.0%	0	0.0%	0	0.0%	1.00	0.0%	0	0	0	0	0	0	0
				840		12688		3865		0.305	1	260						9636

#13 **NH 28 at Linlew Dr**

PM Traffic

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	2015 existing model % ADT	2040 Alt A ADT	2040 Alt A % ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model	
EB Left	15	37.5%	0	#DIV/0!	0	#DIV/0!	1.00	37.5%	15	0	0	0	0	0	0	
EB Thru	10	25.0%	0	#DIV/0!	0	#DIV/0!	1.00	25.0%	10	0	0	0	0	0	0	
EB Right	15	37.5%	0	#DIV/0!	0	#DIV/0!	1.00	37.5%	15	0	0	0	0	0	0	
	40		0		0		1.000	1	40						0	
WB Left	45	16.7%	1319	98.0%	437	47.0%	0.48	8.0%	20	437	262	213	418	618	710	
WB Thru	10	3.7%	0	0.0%	0	0.0%	1.00	3.7%	10	0	0	0	0	0	0	
WB Right	215	79.6%	27	2.0%	493	53.0%	26.43	88.3%	170	493	86	0	478	77	44	
	270		1346		930		0.691	1	190						754	
NB Left	20	2.1%	0	0.0%	0	0.0%	1.00	2.1%	20	0	0	0	0	0	0	
NB Thru	855	89.5%	12136	100.0%	6017	99.0%	1.00	89.5%	430	6017	12591	14578	18330	8743	8598	120
NB Right	80	8.4%	1	0.0%	61	1.0%	121.81	8.4%	40	61	0	0	0	1	1	
	955		12137		6078		0.501	1	480						8599	
SB Left	170	10.8%	790	6.2%	810	21.0%	3.37	36.3%	170	810	208	427	2384	878	693	
SB Thru	1400	88.9%	11898	93.8%	3055	79.0%	1.00	63.4%	300	3055	11940	13963	14812	8462	8943	
SB Right	5	0.3%	0	0.0%	0	0.0%	1.00	0.3%	5	0	0	0	0	0	0	
	1575		12688		3865		0.305	1	480						9636	

Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward
Manual adjustment to balance between intersections

#14 **NH 28 at Ashleigh Dr**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
125	3295	1867	EB Left	10	50.0%	664	37.0%	646	40.3%	1.09	51.3%	10	646	523	988	1052	623	613
		381	EB Thru	5	25.0%	13	0.7%	9	0.6%	1.00	25.0%	5	9	8	7	9	10	10
		3378	EB Right	5	25.0%	1117	62.3%	947	59.1%	0.95	23.7%	5	947	1072	663	597	1022	1033
				20		1794		1602		0.893	1.000	20						1656
381	3295	3378	WB Left	180	63.2%	952	60.9%	885	57.6%	0.95	59.7%	170	885	1011	902	565	952	964
		125	WB Thru	5	1.8%	13	0.8%	9	0.6%	1.00	1.8%	5	9	8	100	9	10	10
		1867	WB Right	100	35.1%	599	38.3%	643	41.8%	1.09	38.5%	110	643	518	6144	1008	618	606
				285		1564		1537		0.983	1	280						1580
3378	3295	125	NB Left	5	0.6%	1121	9.2%	934	14.3%	1.56	0.6%	5	934	1391	676	597	1018	1013
		1867	NB Thru	610	73.1%	10087	82.9%	4709	72.3%	1.00	73.1%	330	4709	4314	19350	17663	6854	6685
		381	NB Right	220	26.3%	955	7.9%	867	13.3%	1.70	26.3%	120	867	1332	805	566	949	944
				835		12163		6510		0.535	1	450						8642
1867	3295	381	SB Left	100	13.6%	596	5.0%	660	17.9%	3.58	12.3%	30	660	197	5937	1008	621	626
		3378	SB Thru	630	85.7%	10619	89.4%	2358	64.1%	1.00	85.7%	200	2358	3258	19426	16605	7697	7927
		125	SB Right	5	0.7%	660	5.6%	659	17.9%	3.22	2.0%	5	659	204	982	1052	627	632
				735		11875		3677		0.310	1	230						9185

#14 **NH 28 at Ashleigh Dr**

PM Traffic

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
EB Left	40	66.7%	664	37.0%	646	40.3%	1.09	67.5%	30	646	523	988	1052	623	613
EB Thru	10	16.7%	13	0.7%	9	0.6%	1.00	16.7%	10	9	8	7	9	10	10
EB Right	10	16.7%	1117	62.3%	947	59.1%	0.95	15.8%	10	947	1072	663	597	1022	1033
	60		1794		1602		0.893	1.000	50						1656
WB Left	345	71.1%	952	60.9%	885	57.6%	0.95	67.3%	320	885	1011	902	565	952	964
WB Thru	5	1.0%	13	0.8%	9	0.6%	1.00	1.0%	5	9	8	100	9	10	10
WB Right	135	27.8%	599	38.3%	643	41.8%	1.09	31.7%	150	643	518	6144	1008	618	606
	485		1564		1537		0.983	1.000	480						1580
NB Left	5	0.5%	1121	9.2%	934	14.3%	1.56	0.7%	5	934	1391	676	597	1018	1013
NB Thru	800	75.1%	10087	82.9%	4709	72.3%	1.00	75.1%	430	4709	4314	19350	17663	6854	6685
NB Right	260	24.4%	955	7.9%	867	13.3%	1.70	24.2%	140	867	1332	805	566	949	944
	1065		12163		6510		0.535	1.000	570						8642
SB Left	110	9.1%	596	5.0%	660	17.9%	3.58	8.2%	30	660	197	5937	1008	621	626
SB Thru	1095	90.5%	10619	89.4%	2358	64.1%	1.00	90.5%	330	2358	3258	19426	16605	7697	7927
SB Right	5	0.4%	660	5.6%	659	17.9%	3.22	1.3%	5	659	204	982	1052	627	632
	1210		11875		3677		0.310	1.000	370						9185

Percetage adjusted manually to add to 100% on approach

Existing percentages or volumes carried forward

#15 NH 28 at Scobie Pond Rd

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	**2040 Alt A** ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
2099	1867	3295	WB Left	80	69.6%	2115	98.6%	850	61.5%	0.62	43.4%	30	850	1139	387	507	1026	958
		793	WB Right	35	30.4%	29	1.4%	531	38.5%	28.43	56.6%	40	531	307	1328	1681	85	95
				115		2144		1381		0.644	1.00	70						1053
3295	1867	793	NB Thru	645	94.2%	9581	84.4%	5429	90.5%	1.07	96.4%	350	5429	4912	20011	19301	7425	7245
		2099	NB Right	40	5.8%	1769	15.6%	569	9.5%	0.61	3.6%	10	569	444	327	423	669	659
				685		11350		5998		0.528	1.00	360						7904
793	1867	2099	SB Left	15	2.0%	21	0.2%	652	18.7%	87.26	20.2%	50	652	254	1099	1324	47	71
		3295	SB Thru	720	98.0%	9760	99.8%	2828	81.3%	0.81	79.8%	210	2828	2520	20020	18157	7919	8227
				735		9781		3480		0.356	1.00	260						8298

#15 NH 28 at Scobie Pond Rd

PM Traffic

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	**2040 Alt A** ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model
WB Left	70	70.0%	2115	98.6%	850	61.5%	0.62	43.7%	30	850	1139	387	507	1026	958
WB Right	30	30.0%	29	1.4%	531	38.5%	28.43	56.3%	30	531	307	1328	1681	85	95
	100		2144		1381		0.644	1.00	60						1053
NB Thru	700	81.4%	9581	84.4%	5429	90.5%	1.07	87.3%	390	5429	4912	20011	19301	7425	7245
NB Right	160	18.6%	1769	15.6%	569	9.5%	0.61	12.7%	60	569	444	327	423	669	659
	860		11350		5998		0.528	1.00	450						7904
SB Left	40	3.4%	21	0.2%	652	18.7%	87.26	3.4%	10	652	254	1099	1324	47	71
SB Thru	1125	96.6%	9760	99.8%	2828	81.3%	0.81	96.6%	400	2828	2520	20020	18157	7919	8227
	1165		9781		3480		0.356	1.00	410						8298

Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward

#16 **NH 102/NH Rt 28 Bypass/E Derry Rd (circle)**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model	Manual Alt A Adjustments	
3535	1841	2143	EB Left	60	16.2%	0	0.0%	0	0.0%	1.00	16.2%	70	0	0	0	0	0	0		
		1878	EB Thru(102)	120	32.4%	3246	60.5%	3757	56.9%	0.94	30.5%	140	3757	1873	1034	2402	3392	3182		
		2054	EB Thru (EDR)	90	24.3%	1277	23.8%	1695	25.7%	1.08	26.2%	120	1695	1754	1882	1785	2091	2018		
		1842	EB Right	100	27.0%	839	15.6%	1153	17.5%	1.12	27.1%	120	1153	1063	1125	1092	1155	1051		
				370		5362		6605		1.232	1.00	460						6251		
1878	1841	2054	WB Left (EDR)	5	1.5%	0	0.0%	0	0.0%	1.00	1.5%	5	0	0	0	0	0	0		
		1842	WB Left (28 Byp S)	75	22.7%	1261	40.0%	562	20.8%	0.52	11.8%	30	562	536	546	599	654	724		
		3535	WB Thru	240	72.7%	1889	60.0%	2145	79.2%	1.32	83.7%	230	2145	984	1258	2402	1886	1655		
		2143	WB Right	10	3.0%	0	0.0%	1	0.0%	1.00	3.0%	10	1	0	0	1	0	0		
				330		3150		2708		0.860	1.000	280						2379		
1842	1841	3535	NB Left	75	20.0%	928	16.1%	1371	37.5%	2.33	45.0%	108	1371	1070	1055	1044	1042	1066	100	-10
		2143	NB Thru	245	65.3%	3939	68.2%	1382	37.8%	0.55	36.2%	90	1382	1670	2118	1890	1377	1404	100	10
		1878	NB Right (102)	50	13.3%	620	10.7%	459	12.6%	1.17	15.6%	40	459	340	485	539	518	565		
		2054	NB Right (EDR)	5	1.3%	287	5.0%	444	12.1%	2.44	3.3%	10	444	555	469	439	420	444		
				375		5774		3656		0.633	1.000	240						3479		
2143	1841	1878	SB Left (102)	15	3.4%	0	0.0%	0	0.0%	1.00	3.4%	10	0	0	0	0	0	0		
		2054	SB Left (EDR)	120	27.0%	2453	37.0%	2983	58.2%	1.57	44.4%	150	2983	2077	1980	2620	1970	1971		
		1842	SB Thru	250	56.2%	4120	62.2%	2096	40.9%	0.66	36.9%	130	2096	2334	2684	2268	1783	1796		
		3535	SB Right	60	13.5%	56	0.8%	49	1.0%	1.13	15.3%	50	49	48	66	129	70	77		
				445		6629		5128		0.774	1.000	340	5128					3844		
2054	1841	1842	EDR LT (28 B S)	10	2.1%	232	7.2%	184	3.9%	0.55	1.2%	10	184	212	260	264	241	277		
		3535	EDR LT (102 WB)	165	35.1%	1548	48.0%	3057	65.1%	1.36	54.5%	370	3057	1728	1784	1779	2631	2879	325	-45
		2143	EDR Thru (28 B N)	280	59.6%	1447	44.8%	1454	31.0%	0.69	41.1%	280	1454	1853	1885	2319	1073	1052	325	45
		1878	EDR RT (102 EB)	15	3.2%	0	0.0%	0	0.0%	1.00	3.2%	20	0	0	0	0	0	0		
				470		3227		4695		1.455	1.000	680						4208		

#16 **NH 102/NH Rt 28 Bypass/E Derry Rd (circle)**

PM Traffic

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model	Manual Alt A Adjustments
EB Left	40	6.5%	0	0.0%	0	0.0%	1.00	6.5%	50	0	0	0	0	0	0	
EB Thru(102)	245	39.5%	3246	60.5%	3757	56.9%	0.94	37.1%	280	3757	1873	1034	2402	3392	3182	
EB Thru (EDR)	265	42.7%	1277	23.8%	1695	25.7%	1.08	45.1%	340	1695	1754	1882	1785	2091	2018	
EB Right	70	11.3%	839	15.6%	1153	17.5%	1.12	11.3%	90	1153	1063	1125	1092	1155	1051	
	620		5362		6605		1.232	1.000	760						6251	
WB Left (EDR)	10	4.2%	0	0.0%	0	0.0%	1.00	4.2%	10	0	0	0	0	0	0	
WB Left (28 By)	60	25.0%	1261	40.0%	562	20.8%	0.52	13.0%	30	562	536	546	599	654	724	
WB Thru	150	62.5%	1889	60.0%	2145	79.2%	1.32	74.5%	160	2145	984	1258	2402	1886	1655	
WB Right	20	8.3%	0	0.0%	1	0.0%	1.00	8.3%	20	1	0	0	1	0	0	
	240		3150		2708		0.860	1.000	210						2379	
NB Left	70	16.5%	928	16.1%	1371	37.5%	2.33	38.4%	100	1371	1070	1055	1044	1042	1066	-10
NB Thru	265	62.4%	3939	68.2%	1382	37.8%	0.55	34.6%	90	1382	1670	2118	1890	1377	1404	10
NB Right (102)	85	20.0%	620	10.7%	459	12.6%	1.17	24.1%	70	459	340	485	539	518	565	
NB Right (EDR)	5	1.2%	287	5.0%	444	12.1%	2.44	2.9%	10	444	555	469	439	420	444	
	425		5774		3656		0.633	1.000	270						3479	
SB Left (102)	15	2.0%	0	0.0%	0	0.0%	1.00	2.0%	10	0	0	0	0	0	0	
SB Left (EDR)	375	50.7%	2453	37.0%	2983	58.2%	1.57	64.6%	370	2983	2077	1980	2620	1970	1971	
SB Thru	315	42.6%	4120	62.2%	2096	40.9%	0.66	28.0%	160	2096	2334	2684	2268	1783	1796	
SB Right	35	4.7%	56	0.8%	49	1.0%	1.13	5.3%	30	49	48	66	129	70	77	
	740		6629		5128		0.774	1.000	570						3844	
EDR LT (28 B S)	10	2.0%	232	7.2%	184	3.9%	1.00	2.0%	10	184	212	260	264	241	277	
EDR LT (102 WB)	195	39.4%	1548	48.0%	3057	65.1%	1.36	56.3%	320	3057	1728	1784	1779	2631	2879	-55
EDR Thru (28 B N)	270	54.5%	1447	44.8%	1454	31.0%	0.69	37.7%	210	1454	1853	1885	2319	1073	1052	55
EDR RT (102 EB)	20	4.0%	0	0.0%	0	0.0%	1.00	4.0%	20	0	0	0	0	0	0	
	495		3227		4695		1.455	1.000	720						4208	

Percetage adjusted manually to add to 100% on approach

Existing percentages or volumes carried forward

Adjusted NB LT volume to divert excess trips destined for Franklin via Rollins and Rt 102 WB onto Crystal (34% of total)

#17 **NH 28 Bypass/Pinkerton St/Nesmith St**

AM Traffic

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	**2040 Alt A** ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model	Manual Alt A Adjustments		
2110	1840	3532	EB Left	10	4.8%	331	11.6%	109	2.9%	0.25	1.2%	10	109	107	146	149	129	133			
			EB Thru	15	7.1%	0	0.0%		0.0%	1.00	7.1%	20						0			
		2143	EB Right	185	88.1%	2534	88.4%	3662	97.1%	1.10	91.7%	260	3662	2972	3153	3371	2038	2040		5128	
				210		2865		3771		1.316	1.000	280						2173			
	1840		WB Left	5	5.3%	0	#DIV/0!	0	#DIV/0!	1.00	5.3%	10						0			
			WB Thru	40	42.1%	0	#DIV/0!	0	#DIV/0!	1.00	42.1%	40						0			
			WB Right	50	52.6%	0	#DIV/0!	0	#DIV/0!	1.00	52.6%	50						0			
				95		0		0		1.000	1.000	100						0			
2143	1840	2110	NB Left	230	38.7%	2353	43.7%	1881	66.3%	1.52	62.3%	190	1881	2597	3004	3223	1399	1403	55	275.8065	280
		3532	NB Thru	360	60.5%	3033	56.3%	955	33.7%	0.60	36.2%	110	955	926	999	986	1051	1053		159.6774	160
			NB Right	5	0.8%	0	0.0%		0.0%	1.00	1.5%	5						0		7.258065	10
				595		5386		2836		0.527	1.000	310						2456		450	450
																				1.451613	
3532	1840		SB Left	10	3.2%	0	0.0%	0	0.0%	1.00	3.2%	10						0		442.7419	
		2143	SB Thru	255	82.3%	4095	92.9%	1466	92.5%	1.00	81.9%	90	1466	1487	1577	1645	1785	1804			
		2110	SB Right	45	14.5%	313	7.1%	119	7.5%	1.00	14.9%	20	119	135	146	144	180	222			
				310		4408		1585		0.360	1.000	110						2026			

#17 **NH 28 Bypass/Pinkerton St/Nesmith St**

PM Traffic

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	**2040 Alt A** ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NoBd Model	Manual Alt A Adjustments		
EB Left	10	2.1%	331	11.6%	109	2.9%	0.25	1.6%	10	109	107	146	149	129	133			
EB Thru	40	8.2%	0	0.0%	0	0.0%	1.00	8.2%	50	0	0	0	0	0	0			
EB Right	435	89.7%	2534	88.4%	3662	97.1%	1.10	90.2%	580	3662	2972	3153	3371	2038	2040			
	485		2865		3771		1.316	1.000	640						2173			
WB Left	5	9.1%	0	#DIV/0!	0	#DIV/0!	1.00	9.1%	10	0	0	0	0	0	0			
WB Thru	30	54.5%	0	#DIV/0!	0	#DIV/0!	1.00	54.5%	30	0	0	0	0	0	0			
WB Right	20	36.4%	0	#DIV/0!	0	#DIV/0!	1.00	36.4%	20	0	0	0	0	0	0			
	55		0		0		1.000	1.000	60						0			
NB Left	185	31.1%	2353	43.7%	1881	66.3%	1.52	58.1%	180	1881	2597	3004	3223	1399	1403	65	214.8387	215
NB Thru	400	67.2%	3033	56.3%	955	33.7%	0.60	40.2%	120	955	926	999	986	1051	1053		143.2258	145
NB Right	10	1.7%	0	0.0%	0	0.0%	1.00	1.7%	10	0	0	0	0	0	0		11.93548	10
	595		5386		2836		0.527	1.000	310						2456		370	370
																	1.193548	
SB Left	25	7.5%	0	0.0%	0	0.0%	1.00	7.5%	25	0	0	0	0	0	0		370	
SB Thru	295	88.1%	4095	92.9%	1466	92.5%	1.00	88.1%	110	1466	1487	1577	1645	1785	1804			
SB Right	15	4.5%	313	7.1%	119	7.5%	1.00	4.5%	10	119	135	146	144	180	222			
	335		4408		1585		0.360	1.000	120						2026			

Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward
Manual adjustment to balance to traffic circle
Adjusted NB LT volume to divert excess trips destined for Franklin via Rollins and Rt 102 WB onto Crystal (34% of total)

#18 **NH 28 Bypass at Tsienneto Rd**

Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	AM Traffic 2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NBld Model
2108	1839	1838	EB Left	120	40.0%	1564	41.2%	1080	15.7%	0.38	28.0%	150	1080	159	202	475	1070	1096
		2086	EB Thru	100	33.3%	1630	43.0%	5298	77.1%	1.79	59.8%	320	5298	2144	3385	4367	3469	3786
		3532	EB Right	80	26.7%	601	15.8%	497	7.2%	0.46	12.2%	70	497	532	542	527	582	585
				300		3795		6875		1.812	1.000	540						
2086	1839	3532	WB Left	80	18.2%	387	8.9%	310	4.4%	0.50	9.1%	60	310	310	318	348	372	370
		2108	WB Thru	270	61.4%	3623	83.0%	6341	90.4%	1.09	66.8%	470	6341	3975	3287	6292	5854	5536
		1838	WB Right	90	20.5%	355	8.1%	366	5.2%	0.64	24.1%	170	366	252	151	193	200	210
				440		4365		7017		1.608	1.000	710						
3532	1839	2108	NB Left	100	29.4%	0	0.0%	0	0.0%	1.00	29.4%	30	0	0	0	0	0	0
		1838	NB Thru	220	64.7%	2910	88.7%	623	66.3%	0.75	53.0%	50	623	597	675	615	708	716
		2086	NB Right	20	5.9%	370	11.3%	316	33.7%	2.98	17.5%	20	316	315	310	346	362	361
				340		3280		939		0.286	1.000	100						
1838	1839	2086	SB Left	25	5.1%	1044	23.0%	554	25.6%	1.12	5.7%	10	554	756	474	2003	935	752
		3532	SB Thru	210	42.9%	3049	67.1%	588	27.2%	0.41	17.4%	40	588	577	591	583	761	821
		2108	SB Right	255	52.0%	453	10.0%	1018	47.1%	4.73	76.9%	180	1018	149	197	349	472	476
				490		4546		2160		0.475	1.000	230						

#18 **NH 28 Bypass at Tsienneto Rd**

	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	PM Traffic 2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NBld Model
EB Left	280	40.0%	1564	41.2%	1080	15.7%	0.38	15.2%	190	1080	159	202	475	1070	1096
EB Thru	345	49.3%	1630	43.0%	5298	77.1%	1.79	79.9%	1010	5298	2144	3385	4367	3469	3786
EB Right	75	10.7%	601	15.8%	497	7.2%	0.46	4.9%	60	497	532	542	527	582	585
	700		3795		6875		1.812	1.000	1270						
WB Left	25	9.3%	387	8.9%	310	4.4%	0.50	4.6%	20	310	310	318	348	372	370
WB Thru	175	64.8%	3623	83.0%	6341	90.4%	1.09	78.8%	340	6341	3975	3287	6292	5854	5536
WB Right	70	25.9%	355	8.1%	366	5.2%	0.64	16.6%	70	366	252	151	193	200	210
	270		4365		7017		1.608	1.000	430						
NB Left	100	22.5%	0	0.0%	0	0.0%	1.00	22.5%	30	0	0	0	0	0	0
NB Thru	320	71.9%	2910	88.7%	623	66.3%	0.75	53.8%	70	623	597	675	615	708	716
NB Right	25	5.6%	370	11.3%	316	33.7%	2.98	23.8%	30	316	315	310	346	362	361
	445		3280		939		0.286	1.000	130						
SB Left	75	16.9%	1044	23.0%	554	25.6%	1.00	16.9%	40	554	756	474	2003	935	752
SB Thru	185	41.6%	3049	67.1%	588	27.2%	0.41	16.9%	40	588	577	591	583	761	821
SB Right	185	41.6%	453	10.0%	1018	47.1%	4.73	66.3%	140	1018	149	197	349	472	476
	445		4546		2160		0.475	1.000	210						

Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward

#19 **NH 102 at Tsienneto Rd**

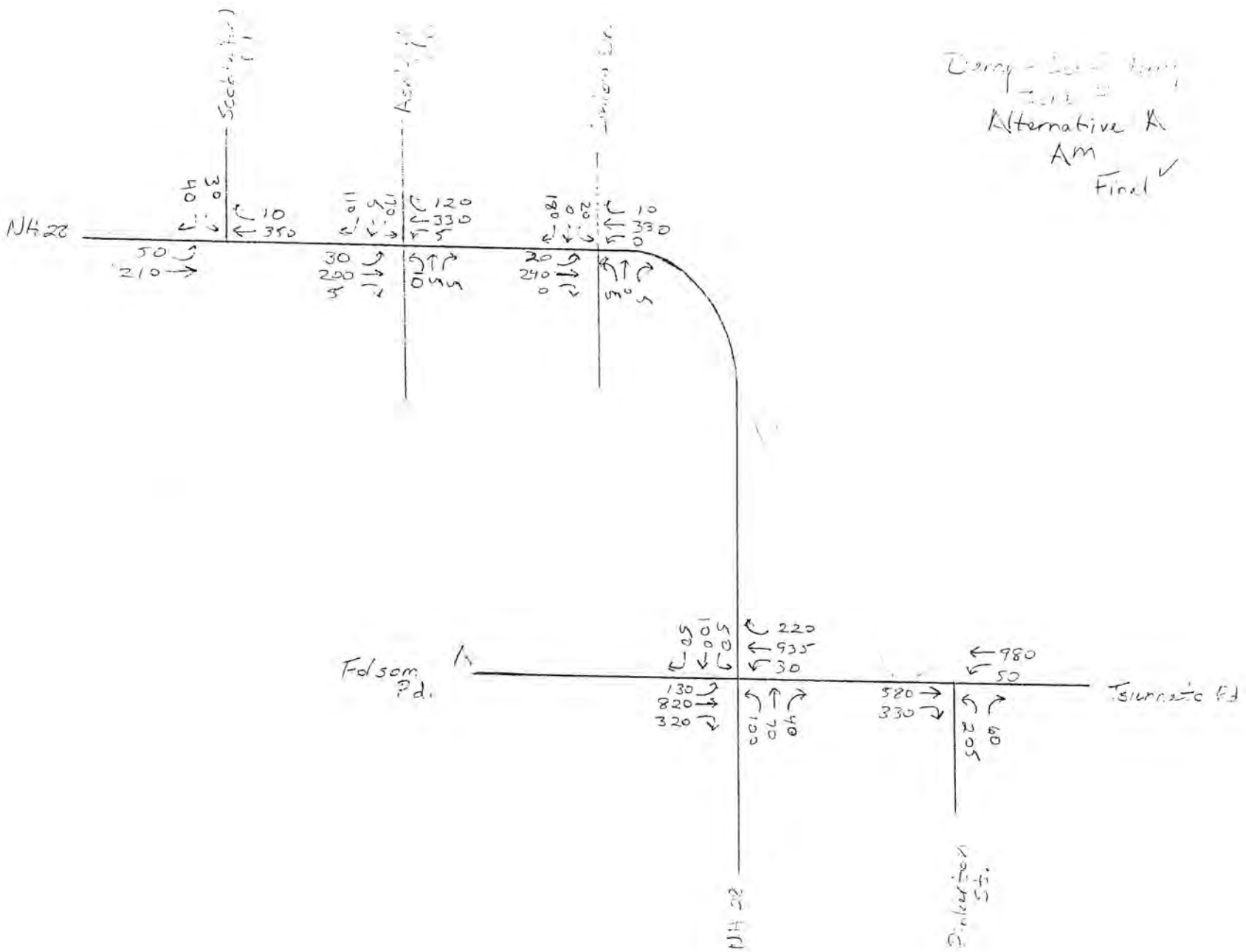
Nodes From	Thru	To		7:45 AM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	AM Traffic 2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NBld Model
1882	1883	2082	EB Left	15	8.3%	404	7.9%	173	4.2%	0.53	4.4%	10	173	601	495	202	325	282
		1884	EB Thru	165	91.7%	4687	92.1%	3917	95.8%	1.04	95.4%	130	3917	1895	1639	3497	3962	3825
				180		5091		4090		0.803	1.00	140						
1884	1883	1882	WB Thru	320	51.6%	3861	55.7%	2954	34.2%	0.61	31.7%	240	2954	1706	2079	3185	3075	2811
		2082	WB Right	300	48.4%	3071	44.3%	5681	65.8%	1.49	68.3%	530	5681	7788	7145	5545	5011	4751
				620		6932		8635		1.246	1.00	770						
2082	1883	1884	SB Left	95	100.0%	1934	88.3%	4803	96.7%	1.09	100.0%	220	4803	7507	7450	5441	3682	3867
		1882	SB Right	0	0.0%	256	11.7%	166	3.3%	0.29	0.0%	0	166	431	439	174	173	172
				95		2190		4969		2.269	1.00	220						

#19 **NH 102 at Tsienneto Rd**

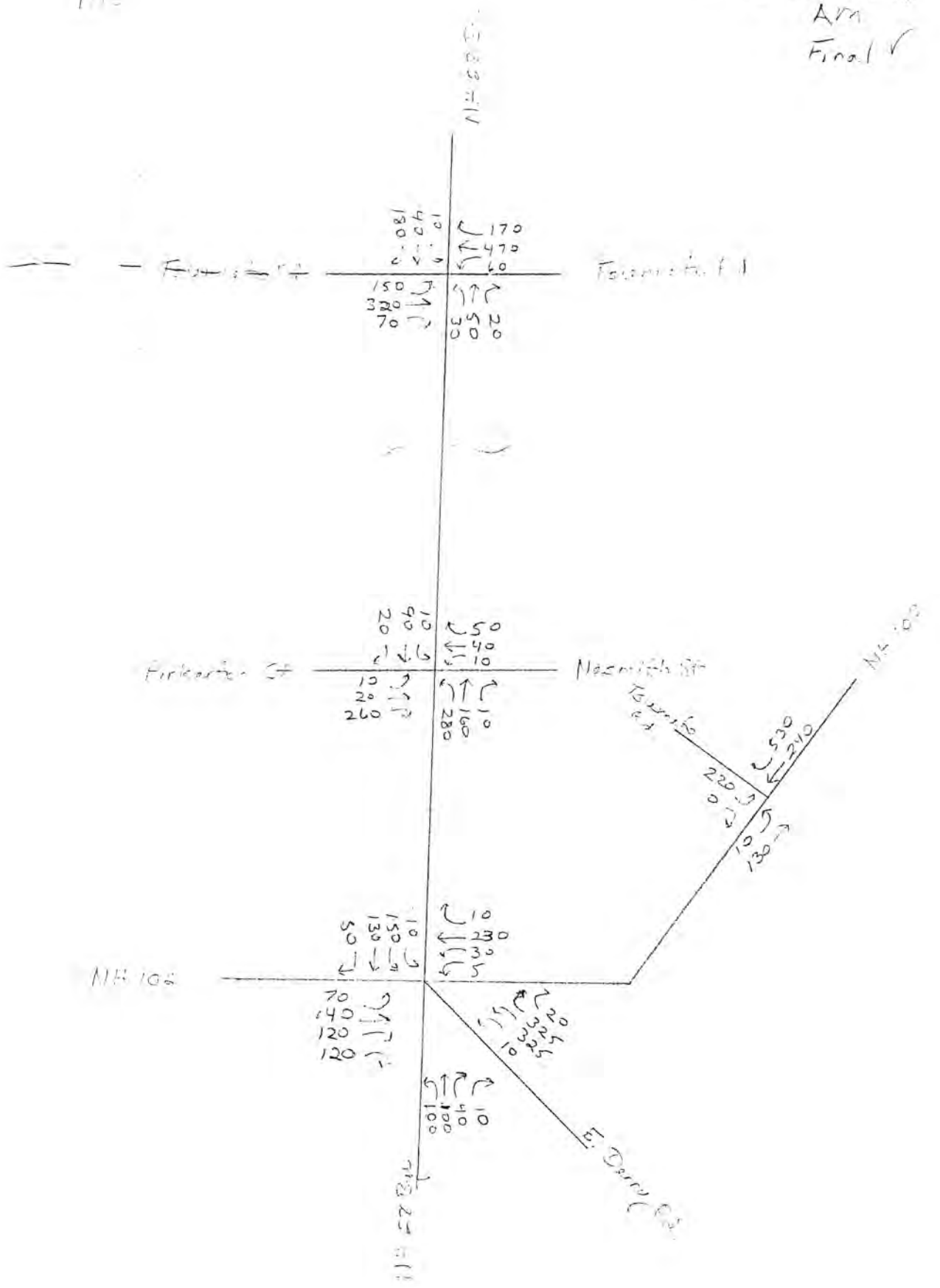
	4:30 PM Adjusted 2015	Exist Turn %	2015 existing model ADT	% ADT	PM Traffic 2040 Alt A ADT	% ADT	Change in ADT ratio	Adj Turn %	Adj Turn Vols	2040 Alt A Model	2040 Alt B Model	2040 Alt C Model	2040 Alt D Model	2040 Alt F Model	2040 NBld Model
EB Left	15	4.0%	404	7.9%	173	4.2%	0.53	2.1%	10	173	601	495	202	325	282
EB Thru	360	96.0%	4687	92.1%	3917	95.8%	1.04	97.9%	290	3917	1895	1639	3497	3962	3825
	375		5091		4090		0.803	1.00	300						
WB Thru	235	55.3%	3861	55.7%	2954	34.2%	0.61	34.0%	180	2954	1706	2079	3185	3075	2811
WB Right	190	44.7%	3071	44.3%	5681	65.8%	1.49	66.0%	350	5681	7788	7145	5545	5011	4751
	425		6932		8635		1.246	1.00	530						
SB Left	270	98.2%	1934	88.3%	4803	96.7%	1.09	99.5%	620	4803	7507	7450	5441	3682	3867
SB Right	5	1.8%	256	11.7%	166	3.3%	0.29	0.5%	0	166	431	439	174	173	172
	275		2190		4969		2.269	1.00	620						

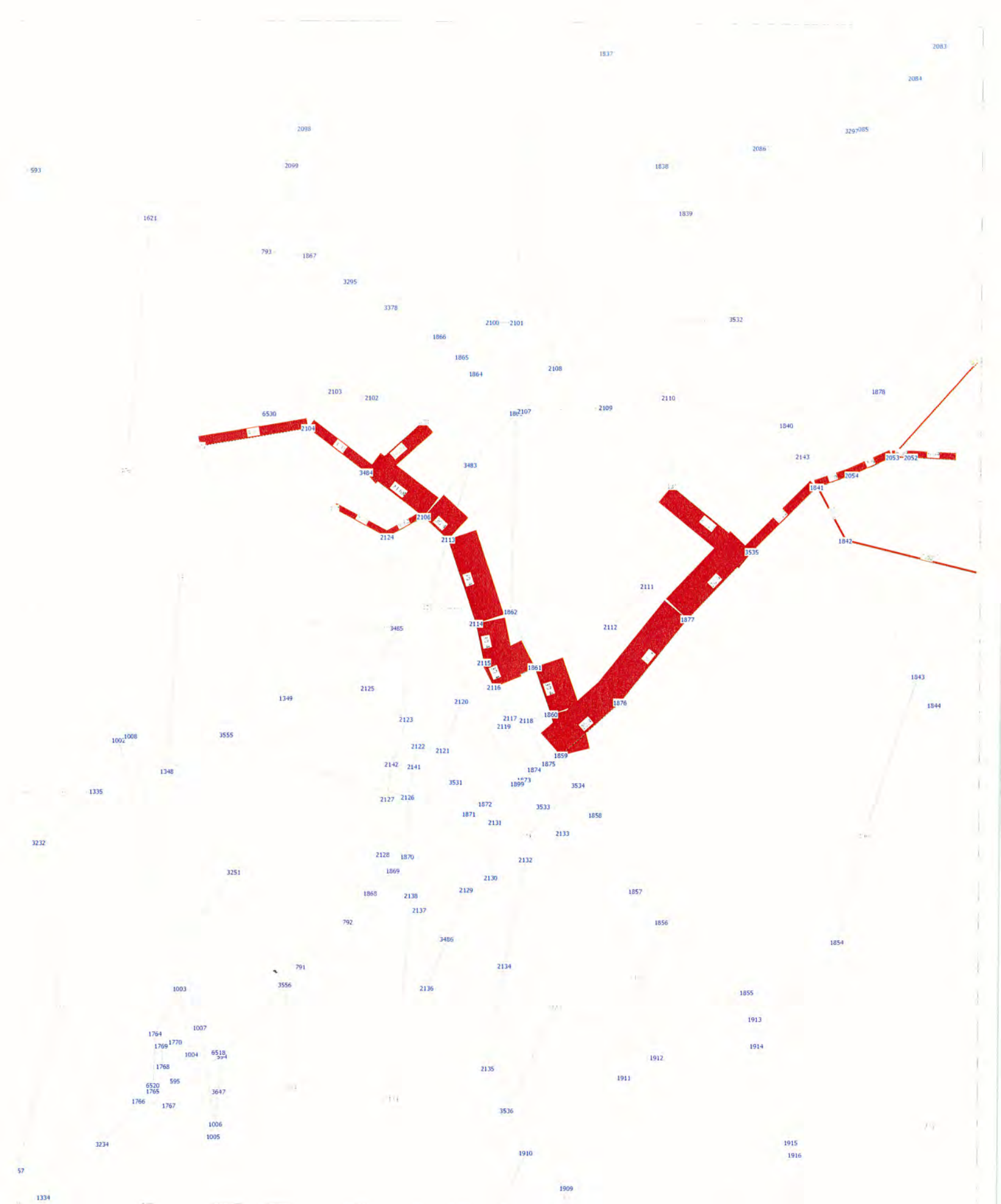
Percetage adjusted manually to add to 100% on approach
Existing percentages or volumes carried forward

Zone 3
Alternative A
AM
Final ✓


Alternative A
AM
Final
NH 28
Folsom Rd.
Sylvester Rd
NH 28
Sylvester Rd

Alternative A
AM
Final ✓


N
Fairfield St
Fairfield St
Neenah St
NB Ramp
NB Ramp
NB Ramp


WB1876-1859 - 2040 No Build
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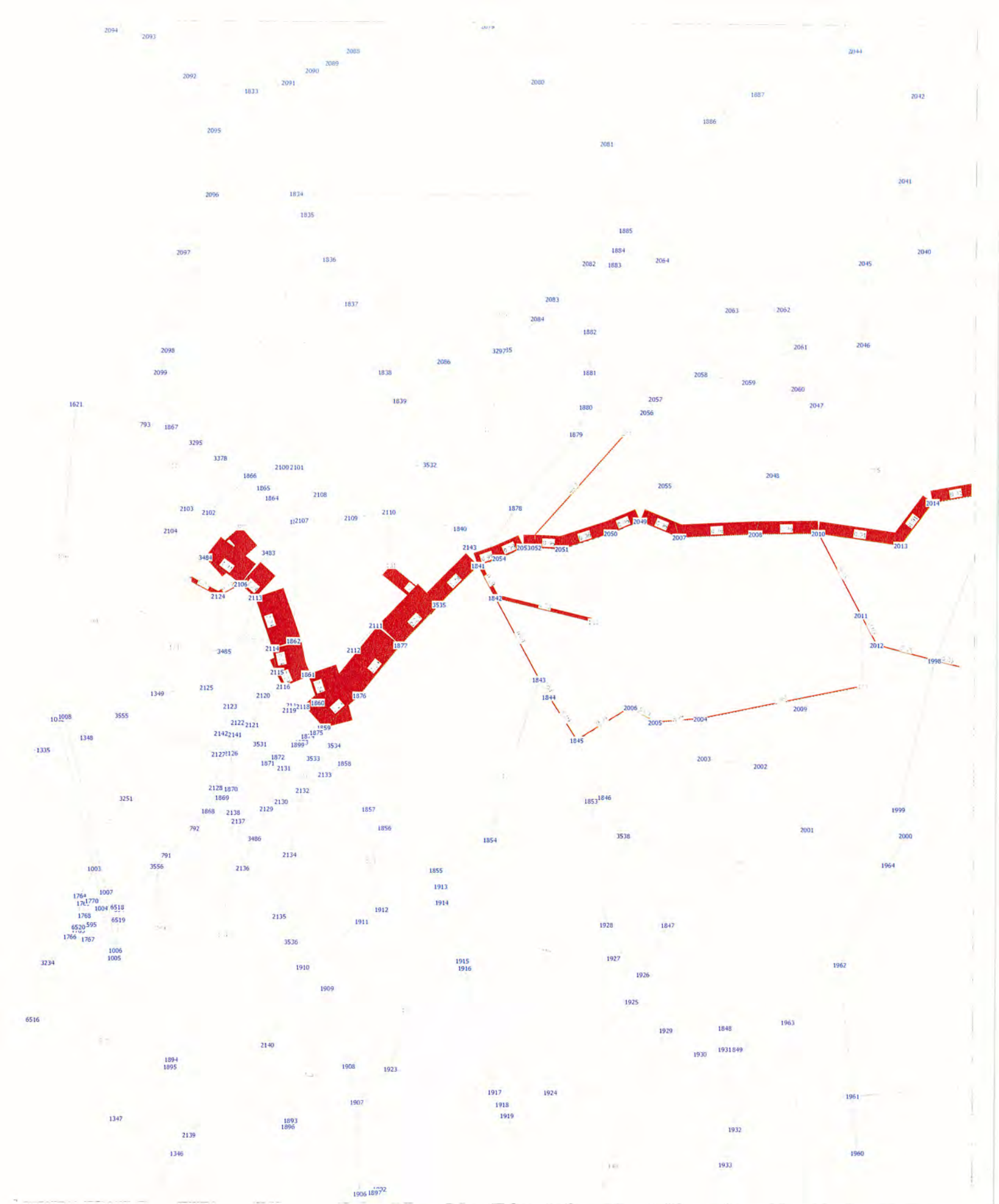
cube



WB1876-1859 - 2015

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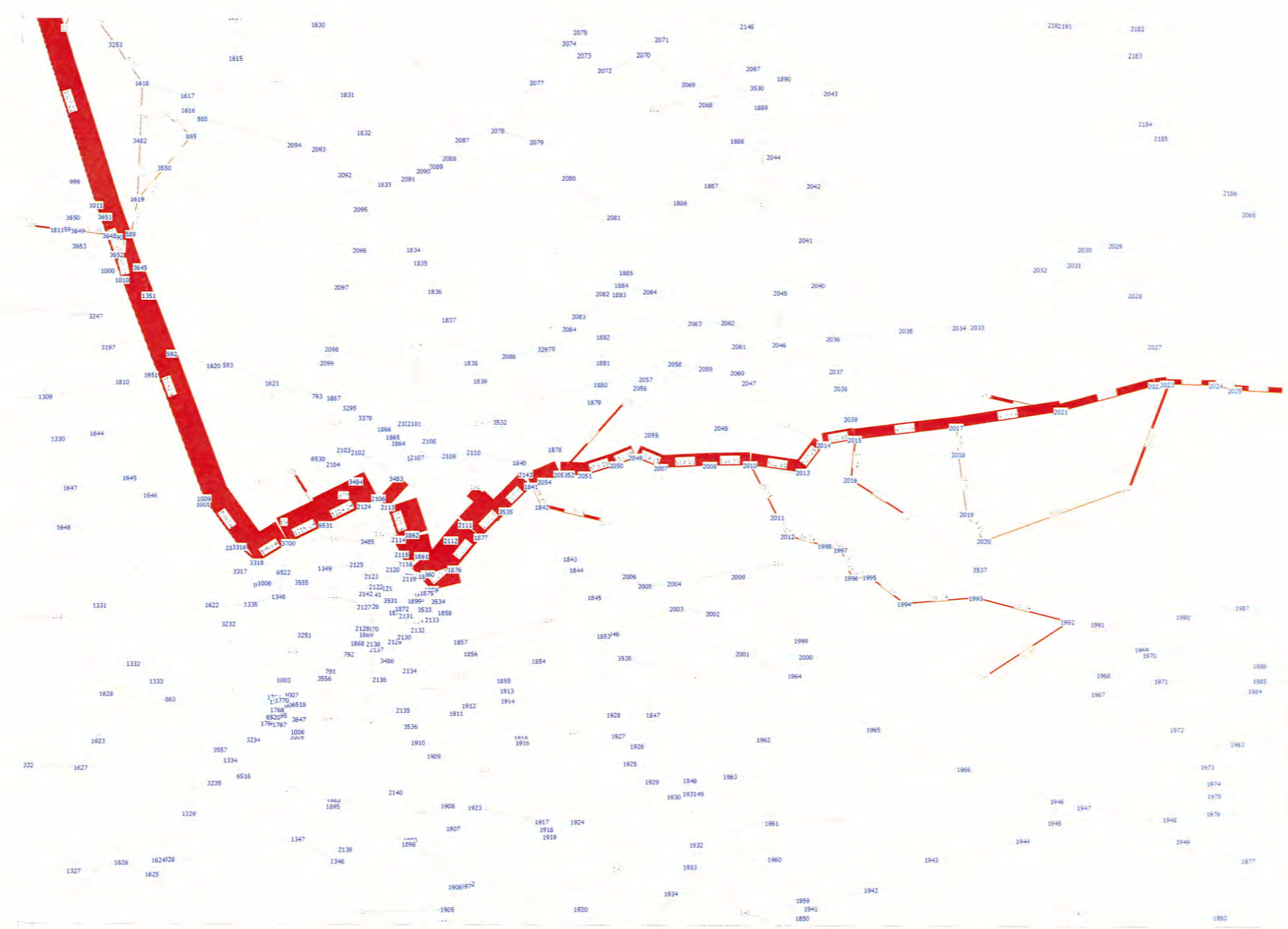

2040 Alt A WB 1859-1876

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APPENDIX L: HCS FREEWAY FACILITY APPENDIX

19-Jun-17

TABLE 10

HCS 2010 - FREEWAY FACILITIES ANALYSIS - 2040 NO-BUILD AND BUILD (South Interchange) CASES - AM and PM PEAK HOURS

Segment	Northbound Direction	2040 No Build						4A Alternative A						4A Alternative B					
		AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)			AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)			AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)		
		BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE
1	I-93 Mainline south of Exit 4	B/0.37			C/0.63			B/0.38			C/0.66			B/0.38			C.0.66		
2	Exit 4 NB off-ramp		A/0.26			B/0.61			A0.23			B/0.67			A/0.23			B/0.67	
3	I-93 Mainline between Exit 4 ramps	A/0.28			B/0.37			A/0.30			B/0.42			A/0.30			B/0.42		
4	Exit 4 NB on-ramp			C/1.25			C/0.99			B/0.89			C/0.70			C/1.03			C/0.81
5	I-93 Mainline between Exit 4 on-ramp and Exit 4A off-ramp							B/0.49			C/0.56			C/0.52			C/0.59		
6	Exit 4A NB off-ramp								C/0.48			C/0.41			C/0.52			C/0.44	
7	I-93 Mainline between Exit 4A ramps							B/0.40			B/0.48			B/0.43			B/0.50		
8	Exit 4A NB on-ramp									C/0.84			C/0.72			C/0.73			B/0.50
9	I-93 Mainline between Exit 4(4A) NB on- and Exit 5 NB off-ramps	B/0.55			C/0.57			C/0.56			C/0.62			C/0.56			C/0.62		
10	Exit 5 NB off-ramp		C/0.37			C/0.49			C/0.43			D/0.58			C/0.41			D/0.54	
11	I-93 Mainline between Exit 5 ramps	B/0.48			B/0.49			B/0.49			C/0.53			B/0.49			C/0.54		
12	Exit 5 NB on-ramp			C/0.83			C/0.62			C/0.67			C0.50			C/0.65			C/0.48
13	I-93 Mainline north of Exit 5	C/0.64			C/0.62			C/0.62			C/0.65			C/0.62			C/0.65		
	Facility operations	B			C			B			C			B			C		
	Space Mean Speed (mph)	68.4			68.6			68.5			67.9			67.6			67.9		
	Density (veh/mi/hr)	15.8			19.2			16.4			20.2			17.3			20.4		
Segment	Southbound Direction																		
1	I-93 Mainline north of Exit 6	C/0.59			C/0.64			C/0.62			C/0.62			C/063			C/0.62		
2	Exit 5 SB off-ramp		D/0.73			D/0.74			C/0.41			C/0.62			C/0.32			C/033	
3	I-93 Mainline between Exit 5 ramps	B/0.46			B/0.49			C/0.55			C/0.53			C/0.57			C/0.55		
4	Exit 5 SB on-ramp			C/0.45			C/0.38			C/0.52			B/0.44			B/0.40			B/0.34
5	I-93 Mainline between Exit 5 SB on- and Exit 4A SB off-ramps							C/0.65			C/0.61			C/0.65			C/0.62		
6	Exit 4A SB off-ramp								D/1.07			D/0.89			D/1.09			D/0.91	
7	I-93 Mainline between Exit 4A ramps							B/0.46			B/0.44			B/0.45			B/0.44		
8	Exit 4A SB on-ramp									C/0.60			C/0.51			C/0.70			C/0.58
9	I-93 Mainline between Exit 5(4A) SB on- and Exit 4 SB off-ramps	C/0.55			C/0.56			C/0.57			D/0.54			C/0.58			D/055		
10	Exit 4 SB off-ramp		C/0.84			D/1.10			C/0.76			C/0.91			C/0.81			D/0.98	
11	I-93 Mainline between Exit 4 SB off- and SB on ramp from east	B/0.36			B/0.33			B/0.43			B/0.36			B/0.43			B/0.36		
12	Exit 4 SB on-ramp from east			B/0.66			B/0.30			B/0.49			A/0.16			B/0.37			A/0.17
13	I-93 Mainline between Exit 4 SB on-ramps	B/0.48			B/0.38			B/0.49			B/0.39			B/0.49			B/0.39		
14	Exit 4 SB on-ramp from west			C/0.85		B/0.40				C/0.93			B/0.44			C/0.92		B/0.43	
15	I-93 Mainline south of Exit 5	C/0.64			B/0.46			C/0.66			B/0.47			C/0.66			B/0.47		
	Facility operations	C			C			C			C			C			C		
	Space Mean Speed (mph)	68.5			68.3			67.4			68.6			67.3			68.4		
	Density (veh/mi/hr)	18.8			19.1			20.6			18.4			20.9			18.9		

N/A

19-Jun-17

TABLE 10 (cont.)

HCS 2010 - FREEWAY FACILITIES ANALYSIS - 2040 NO-BUILD AND BUILD (North or No Interchange) CASES - AM and PM PEAK HOURS

		2040 No Build						4A Alternative C						4A Alternative D						4A Alternative F					
		AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)			AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)			AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)			AM Peak Hour (LOS) / (d/c ratio)			PM Peak Hour (LOS) / (d/c ratio)		
Segment	Northbound Direction	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE	BASIC	DIVERGE	MERGE
1	I-93 Mainline south of Exit 4	B/0.37			C/0.63			B/0.37			C/0.64			B/0.37			C/0.64			B/037			C/0.64		
2	Exit 4 NB off-ramp		A/0.26			B/0.61			A/0.24			B/0.56			A/0.25			B/0.59			A/0.26			B/0.62	
3	I-93 Mainline between Exit 4 ramps	A/0.28			B/0.37			A/0.28			B/0.39			A/0.28			B/0.38			A/0.28			B/037		
4	Exit 4 NB on-ramp			C/1.25			C/0.99			B/0.93			B/0.73			B/0.90			B/0.71			C/1.25			C/0.99
5	I-93 Mainline between Exit 4 on-ramp and Exit 4A off-ramp	N/A						B/0.49			C/0.54			B/0.48			B/0.52			B/0.55			C/0.57		
6	Exit 4A NB off-ramp								B/0.15			C/0.13			B/0.08			B/0.07								
7	I-93 Mainline between Exit 4A ramps							B/0.46			B/0.51			B/0.46			B/0.51								
8	Exit 4A NB on-ramp									C/0.74			C/0.63			C/0.76			C/0.64						
9	I-93 Mainline between Exit 4(4A) NB on- and Exit 5 NB off-ramps	B/0.55			C/0.57			C/0.60			C/0.64			C/0.60			C/0.64								
10	Exit 5 NB off-ramp		C/0.37			C/0.49			C/0.40			C/0.51			C/0.41			D/0.55			C/0.36			C/0.48	
11	I-93 Mainline between Exit 5 ramps	B/0.48			B/0.49			C/0.53			C/0.56			C/0.53			C/0.55			B/0.49			B/0.49		
12	Exit 5 NB on-ramp			C/0.83			C/0.62			C/0.48			C/0.36			C/0.49			C/0.39			C/0.82			C/0.62
13	I-93 Mainline north of Exit 5	C/0.64			C/0.62			C/0.63			C/0.63			C/0.63			C/0.63			C/0.65			C/0.62		
	Facility operations	B			C			B			C			B			C			B			C		
	Space Mean Speed (mph)	68.4			68.6			68.4			68.3			68.6			68.4			68.4			68.6		
	Density (veh/mi/hr)	15.8			19.2			16.4			19.7			16.4			19.5			15.8			19.2		
Segment	Southbound Direction																								
1	I-93 Mainline north of Exit 6	C/0.59			C/0.64			C/0.62			C/0.61			C/0.62			C/0.61			C/0.58			C/064		
2	Exit 5 SB off-ramp		D/0.73			D/0.74			C/0.31			C/0.31			C/0.31			C/0.32			C/0.66			C/0.67	
3	I-93 Mainline between Exit 5 ramps	B/0.46			B/0.49			C/0.57			C/0.55			C/0.57			C/0.55			B/0.47			B/0.50		
4	Exit 5 SB on-ramp			C/0.45			C/0.38			C/0.45			C/0.38			C/0.44			C/0.38			B/0.45			B/0.38
5	I-93 Mainline between Exit 5 SB on- and Exit 4A SB off-ramps	N/A						C/0.66			C/0.63			C/0.66			C/0.62			C/0.55			C/0.57		
6	Exit 4A SB off-ramp								D/0.92			D/0.79			D/0.91			D/0.78								
7	I-93 Mainline between Exit 4A ramps							B/0.48			B/0.46			B/0.48			B/0.46								
8	Exit 4A SB on-ramp									B/0.27			B/0.23			B/0.25			B/0.21						
9	I-93 Mainline between Exit 5(4A) SB on- and Exit 4 SB off-ramps	C/0.55			C/0.56			B/0.52			B/0.51			B/0.52			B/0.50								
10	Exit 4 SB off-ramp		C/0.84			D/1.10			C/0.64			C/0.76			C/0.63			C/0.75			C/0.85			D/1.12	
11	I-93 Mainline between Exit 4 SB off- and SB on ramp from east	B/0.36			B/0.33			B/0.40			B/0.34			B/0.40			B/0.34			B/0.36			B/0.33		
12	Exit 4 SB on-ramp from east			B/0.66			B/0.30			B/0.46			B/0.21			B/0.46			B/0.21			B/0.67			B/0.30
13	I-93 Mainline between Exit 4 SB on-ramps	B/0.48			B/0.38			C/0.48			B/0.38			B/0.48			B/0.38			B/0.48			B/0.38		
14	Exit 4 SB on-ramp from west			C/0.85		B/0.40				C/0.86			B/0.40			C/0.85			B/0.40			C/0.84			B/0.39
15	I-93 Mainline south of Exit 5	C/0.64			B/0.46			C/0.64			B/0.46			C/0.64			B/0.46			C/0.64			B/0.46		
	Facility operations	C			C			C			C			C			C			C			B		
	Space Mean Speed (mph)	68.5			68.3			67.9			68.5			67.9			68.6			68.5			68.4		
	Density (veh/mi/hr)	18.8			19.1			19.9			17.8			19.8			17.8			18.8			19.1		

4A 2015 Freeway Facility - Northbound

Station	Length	Node	Description	Accel/Decel		Lanes	FFS	%Trucks/RV	PHF						
1526+70		a													
	5280	1	Basic Highway			1 lanes	70 mph	4.11 / 0.57		AM & PM From Permanent Recorder Station South of Exit 4					
1579+50		b							0.94	Default Value for all Mainline Segments per NHDOT					
	1500	2	Diverge- Exit 4 off Ramp	Decel	814	1 lane	50 mph	7.4	0.77	AM	NB Right and Left intersection turning movements				
1594+50	PVM	c						1.8	0.92	PM					
	3275	3	Basic Highway					4.11 / 0.57		AM & PM From Permanent Recorder Station South of Exit 4					
1627+25	PVM	d													
	1500	4	Merge - Exit 4 on Ramp	Accel	1400	1 lane	50 mph	3.4	0.90	AM	WB Right intersection turning movements				
1642+25		e						2.5	0.87	PM					
	13025	5	Basic Highway					7.5 / 0.0		AM From Noise Study Counts Location A-B					
1772+50		f						3 / 0.3		PM From Noise Study Counts Location A-B					
	1500	6	Diverge- Exit 5 off Ramp	Decel	480	1 lane	50 mph	9.1	0.75	AM	NB Right and Left intersection turning movements				
1787+50		g						7.5	0.67	PM					
	4100	7	Basic Highway					7.5 / 0.0		AM From Noise Study Counts Location A-B					
1828+50		h						3 / 0.3		PM From Noise Study Counts Location A-B					
	1500	8	Merge - Exit 5 on Ramp	Accel	750	1 lane	50 mph	5.7	0.83	AM	WB Right intersection turning movements				
1843+50		i						2.4	0.89	PM					
	5280	9	Basic Highway					7.5 / 0.0		AM From Noise Study Counts Location A-B					
1896+30		j						3 / 0.3		PM From Noise Study Counts Location A-B					

4A 2015 Freeway Facility - Southbound

Station	Length	Node	Description	Accel/Decel		Lane	FFS	%Trucks/%RV	PHF							
3892+80		a						6.2 / 0.1		AM - From Noise Study Counts Location A-B						
	5280	1	Basic Highway			2 lanes	70 mph	3.62 / 0.3		PM - From Noise Study Counts Location A-B						
3840+00		b							0.94	AM & PM Default Value for all Mainline						
	1500	2	Diverge- Exit 5 off Ramp	Decel	520	1 lane	50 mph	5.77	0.74	AM	SB Right and Left Intersection turning movements					
3825+00		c						4.28	0.885	PM						
	3920	3	Basic Highway					6.2 / 0.1		AM - From Noise Study Counts Location A-B						
3785+80		d						3.62 / 0.3		PM - From Noise Study Counts Location A-B						
	1500	4	Merge - Exit 5 on Ramp	Accel	880	1 lane	50 mph	9.81	0.84	AM	EB right & WB Left intersection turning movements					
3770+80		e						4.41	0.81	PM						
	11730	5	Basic Highway					6.2 / 0.1		AM - From Noise Study Counts Location A-B						
3653+50		f						3.62 / 0.3		PM - From Noise Study Counts Location A-B						
	1500	6	Diverge- Exit 4 off Ramp	Decel	739	1 lane	50 mph	5.2	0.95	AM						
3638+50	PVM	g						2.85	0.92	PM						
	2550	7	Basic Highway					3.78 / 0.62			AM & PM From Permanent Recorder Station South of Exit 4					
3613+00	PVM	h							0.94	AM/PM	Default Value					
	1500	8	Merge - Exit 4 on Ramp	Accel	1612	1 lane	30 mph	6.20	0.82	AM	Default value					
3598+00		i	30 mph					4.0	0.82	PM	Default value					
	600	9	Basic Highway						0.94	AM/PM	Default Value					
3592+00	PVM	j						3.78 / 0.62			AM & PM From Permanent Recorder Station South of Exit 4					
	1500	10	Merge - Exit 4 on Ramp	Accel	1400	1 lane	50 mph	6.2	0.82	AM	Default Value					
3577+00		k						4.0	0.82	PM	Default Value					
	5280	11	Basic Highway					3.78 / 0.62	0.94		AM & PM From Permanent Recorder Station South of Exit 4					
3524+20		l														

4A 2040 Freeway Facility - No Build - Northbound

Station	Length	Node	Description		Accel/Decel		Lanes	FFS
1526+20		a						
	5280	1	Basic Highway					70 mph
1579+00		b						
	1500	2	Diverge- Exit 4 off Ramp		Decel	814	2 lanes	50 mph
1594+00	PVM	c		2 Lane				
	4525	3	Basic Highway					
1639+25	PVM	d						
	1500	4	Merge - Exit 4 on Ramp		Accel	1400	1 lane	50 mph
1654+25		e						
	11825	5	Basic Highway					
1772+50		f						
	1500	6	Diverge- Exit 5 off Ramp		Decel	480	1 lane	50 mph
1787+50	PVM	g						
	4100	7	Basic Highway					
1828+50	PVM	h						
	1500	8	Merge - Exit 5 on Ramp		Accel	900	1 lane	50 mph
1843+50		i						
	5280	000+09	Basic Highway					
1896+30		j						

Use same Truck% and PHF as Existing

Contract D

1594+00 PVM for Exit 4 off ramp

1639+25 PMV for Exit 4 on ramp

Contract I

1787+50 PVM for Exit 5 off ramp

1828+50 PCM for Exit 5 on ramp

4A 2040 Freeway Facility - No Build - Southbound

Station	Length	Node	Description	Accel/Decel		Lanes	FFS
3892+80		a					
	5280	1	Basic Highway				
3840+00		b					
	1500	2	Diverge- Exit 5 off Ramp	Decel	750	1 lane	50 mph
3825+00		c					
	3920	3	Basic Highway				
3785+80		d					
	1500	4	Merge - Exit 5 on Ramp	Accel	1420	1 lane	50 mph
3770+80		e					
	11730	5	Basic Highway				
3653+50		f					
	1500	6	Diverge- Exit 4 off Ramp	Decel	738	1 lane	50 mph
3638+50	PVM	g					
	2550	7	Basic Highway				
3613+00	PVM	h					
	1500	8	Merge - Exit 4 on loop Ramp	Accel	1376	1 lane	30 mph
3598+00		i					0
	600	9	Basic Highway				
3592+00	PVM	j					
	1500	10	Merge - Exit 4 on Ramp	Accel	1390	1 lane	50 mph
3577+00		k					
	5280	11	Basic Highway				
3524+20		l					

Use same Truck% and PHF as Existing

4A 2040 Freeway Facility - Alts A&B - Northbound

Station	Length	Node	Description	Accel/Decel		Lanes	FFS	%Trucks/RV	PHF	
1526+20		a								
	5280	1	Basic Highway				70 mph	4.11 / 0.57		AM & PM From Permanent Recorder Station South of Exit 4
1579+00		b							0.94	Default Value for all Mainline Segments per NHDOT
	1500	2	Diverge- Exit 4 off Ramp	Decel	814	2 Lane	50 mph	7.4	0.77	AM
1594+00	PVM	c						1.8	0.92	PM
	4525	3	Basic Highway					4.11 / 0.57		AM & PM From Permanent Recorder Station South of Exit 4
1639+25	PVM	d								
	1500	4	Merge - Exit 4 on Ramp	Accel	1400	1 Lane	50 mph	3.4	0.90	AM
1654+25		e						2.5	0.87	PM
	-700	5	Overlap					7.5 / 0.0		
1647+25		f						3 / 0.3		PM From Noise Study Counts Location A-B
	1500	6	Diverge- Exit 4A off ramp	Decel	750	1 Lane	50 mph	6.41	0.81	AM
1662+25	PVM	g						3.53	0.84	PM
	3310	7	Basic Highway		4A Ramps			7.5 / 0.0		
1695+35	PVM	h						3 / 0.3		
	1500	8	Merge - Exit 4A on Ramp	Accel	890	1 Lane	50 mph	6.41	0.81	AM
1710+35		i						3.53	0.84	PM
	6215	9	Basic Highway					7.5 / 0.0		
1772+50		j						3 / 0.3		
	1500	10	Diverge- Exit 5 off Ramp	Decel	480	1 Lane	50 mph	9.1	0.75	AM
1787+50	PVM	k						7.5	0.67	PM
	4100	11	Basic Highway					7.5 / 0.0		AM From Noise Study Counts Location A-B
1828+50	PVM	l						3 / 0.3		PM From Noise Study Counts Location A-B
	1500	12	Merge - Exit 5 on Ramp	Accel	750	1 Lane	50 mph	5.7	0.83	AM
1843+50		m						2.4	0.89	PM
	5280	13	Basic Highway					7.5 / 0.0		AM From Noise Study Counts Location A-B
1896+30		n						3 / 0.3		PM From Noise Study Counts Location A-B

4A 2040 Freeway Facility - Alts A&B - Southbound

Station	Length	Node	Description	Accel/Decel		Lane	FFS	%Trucks/%RV	PHF	
3892+80		a						6.2 / 0.1		AM - From Noise Study Counts Location A-B
	5280	1	Basic Highway			4 lanes	70 mph	3.62 / 0.3		PM - From Noise Study Counts Location A-B
3840+00		b							0.94	AM & PM Default Value for all Mainline
	1500	2	Diverge- Exit 5 off Ramp	Decel	750	1 lane	50 mph	5.77	0.74	AM
3825+00		c						4.28	0.885	PM
	3920	3	Basic Highway					6.2 / 0.1		AM - From Noise Study Counts Location A-B
3785+80		d						3.62 / 0.3		PM - From Noise Study Counts Location A-B
	1500	4	Merge - Exit 5 on Ramp	Accel	1420	1 lane	50 mph	9.81	0.84	AM
3770+80		e						4.41	0.81	PM
	7615	5	Basic Highway					6.2 / 0.1		AM - From Noise Study Counts Location A-B
3709+65		f						3.62 / 0.3		PM - From Noise Study Counts Location A-B
	1500	6	Diverge- Exit 4A off Ramp	Decel	500	1 lane	50 mph	7.26	0.80	AM Average of known ramps
3694+65		g						4.23	0.84	PM Average of known ramps
	3165	7	Basic Highway		4A Ramps			6.2 / 0.1	0.94	
		h						3.62 / 0.3		
3663+00	PVM	8	Merge	Accel	815	1 lane	50 mph	7.26	0.80	AM Average of known ramps
	1500	i						4.23	0.84	PM Average of known ramps
	-650	9	Overlap							
	1500	j								
3639+50	PVM	10	Diverge	Decel	735	1 lane	50 mph	7.26	0.80	AM Average of known ramps
		k						4.23	0.84	PM Average of known ramps
	2650	11	Basic Highway						0.94	AM/PM Default Value
3613+00	PVM	l						3.78 / 0.62		AM & PM From Permanent Recorder Station South of Exit 4
	1500	12	Merge - Exit 4 on Ramp (loop)	Accel	1376	1 lane	30 mph	6.20	0.82	AM Default Value
3598+00		m						4.0	0.82	PM Default Value
	600	13	Basic Highway						0.94	AM/PM Default Value
3592+00	PVM	n						3.78 / 0.62		AM & PM From Permanent Recorder Station South of Exit 4
	1500	14	Merge - Exit 4 on Ramp	Accel	1390	1 lane	50 mph	6.2	0.82	AM Default Value
3577+00		o						4.0	0.82	PM Default Value
	5280	15	Basic Highway					3.78 / 0.62		AM & PM From Permanent Recorder Station South of Exit 4
3524+20		p								

4A 2040 Freeway Facility - Alts C&D - Northbound

Station	Length	Node	Description	Accel/Decel		Lanes	FFS	%Trucks/RV	PHF	
1526+20		a								
	5280	1	Basic Highway					4.11 / 0.57		AM & PM From Permanent Recorder Station South of Exit 4
1579+00		b							0.94	Default Value for all Mainline Segments per NHDOT
	1500	2	Diverge- Exit 4 off Ramp	Decel	814	2 Lane	50	7.4	0.77	AM
1594+00	PVM	c						1.8	0.92	PM
	4525	3	Basic Highway					4.11 / 0.57		AM & PM From Permanent Recorder Station South of Exit 4
1639+25	PVM	d								
	1500	4	Merge - Exit 4 on Ramp	Accel	1400	1 Lane	50	3.4	0.90	AM
1654+25		e						2.5	0.87	PM
	4497	5	Basic Highway					7.5 / 0.0		AM From Noise Study Counts Location A-B
1699+22		f						3 / 0.3		PM From Noise Study Counts Location A-B
	1500	6	Diverge- Exit 4A off ramp	Decel	734	1 Lane	50	6.41	0.81	AM Average of known ramps
1714+22		g			4A Ramps			3.53	0.84	PM Average of known ramps
	2702	7	Basic Highway					7.5 / 0.0		
1741+24		h						3 / 0.3		
	1500	8	Merge - Exit 4A on Ramp	Accel	1400	1 Lane	50	6.41	0.81	AM Average of known ramps
1756+24		i						3.53	0.84	PM Average of known ramps
	1626	9	Basic Highway					7.5 / 0.0		
1772+50		j						3 / 0.3		
	1500	10	Diverge- Exit 5 off Ramp	Decel	480	1 Lane	50	9.1	0.75	AM
1787+50	PVM	k						7.5	0.67	PM
	4100	11	Basic Highway					7.5 / 0.0		AM From Noise Study Counts Location A-B
1828+50	PVM	l						3 / 0.3		PM From Noise Study Counts Location A-B
	1500	12	Merge - Exit 5 on Ramp	Accel	750	1 Lane	50	5.7	0.83	AM
1843+50		m						2.4	0.89	PM
	5280	13	Basic Highway					7.5 / 0.0		AM From Noise Study Counts Location A-B
1896+30		n						3 / 0.3		PM From Noise Study Counts Location A-B

4A 2040 Freeway Facility - Alts C&D - Southbound

Station	Length	Node	Description	Accel/Decel		Lanes	FFS	%Trucks/%R	PHF	
3892+80		a						6.2 / 0.1		AM - From Noise Study Counts Location A-B
	5280	1	Basic Highway					3.62 / 0.3		PM - From Noise Study Counts Location A-B
3840+00		b							0.94	AM & PM Default Value for all Mainline
	1500	2	Diverge- Exit 5 off Ramp	Decel	750	1 lane	50 mph	5.77	0.74	AM
3825+00		c						4.28	0.885	PM
	3920	3	Basic Highway					6.2 / 0.1		AM - From Noise Study Counts Location A-B
3785+80		d						3.62 / 0.3		PM - From Noise Study Counts Location A-B
	1500	4	Merge - Exit 5 on Ramp	Accel	1420	1 lane	50 mph	9.81	0.84	AM
3770+80		e						4.41	0.81	PM
	2705	5	Basic Highway					6.2 / 0.1		AM - From Noise Study Counts Location A-B
3758+75		f						3.62 / 0.3		PM - From Noise Study Counts Location A-B
	1500	6	Diverge- Exit 4A off Ram	Decel	485	1 lane	50 mph	6.74	0.84	AM Average of known ramps
3743+75		g						3.89	0.86	PM Average of known ramps
	2850	7	Basic Highway		4A Ramps			6.2 / 0.1		
3715+25		h						3 / 0.3		
	1500	8	Merge - Exit 4A on Ramp	Accel	1400	1 lane	50 mph	6.74	0.84	AM Average of known ramps
3700+25		i						3.89	0.86	PM Average of known ramps
	4675	9	Basic Highway						0.94	AM/PM - Default Value
3653+50		j						3.78 / 0.62		AM & PM From Permanent Recorder Station South of Exit 4
	1500	10	Diverge- Exit 4 off Ramp	Decel	738	1 lane	50 mph	5.2	0.95	AM
3638+50	PVM	k						2.85	0.92	PM
	2550	11	Basic Highway					3.78 / 0.62		AM & PM From Permanent Recorder Station South of Exit 4
3613+00	PVM	l							0.94	AM/PM - Default Value
	1500	12	Merge - Exit 4 on Ramp	Accel	1376	1 lane	30 mph	6.20	0.82	AM
3598+00		m						4.0	0.82	PM
	600	13	Basic Highway						0.94	AM/PM - Default Value
3592+00	PVM	n						3.78 / 0.62		AM & PM From Permanent Recorder Station South of Exit 4
	1500	14	Merge - Exit 4 on Ramp	Accel	1390	1 lane	50 mph	6.2	0.82	AM Default Value
3577+00		o						4.0	0.82	PM Default Value
	5280	15	Basic Highway					3.78 / 0.62		AM & PM From Permanent Recorder Station South of Exit 4
3524+20		p								

HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	AM Peak - NB
Analysis Year	2040 No Build - AM	Date	6/8/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	9
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	11825	4
6	Diverge	Diverge	f->g	1500	4
7	Basic	Basic	g->h	4100	4
8	Merge	Merge	h->i	1500	4
9	Basic	Basic	i->j	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3537	9600	0.37	70.0	12.6	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.77	0.979	0.964	3537	1098	9600	4200	0.37	0.26	68.0	60.7	13.0	-2.7	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	2439	9600	0.28	70.0	8.7	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	

1	0.94	0.90	0.979	0.983	4539	2617	9600	2100	0.55	1.25	53.3	61.7	45.0	21.9	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	4539	9600	0.55	70.0	16.2	B

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.75	0.964	0.956	4539	774	9600	2100	0.55	0.37	67.7	61.5	16.8	20.7	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	3765	9600	0.48	70.0	13.4	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.83	0.964	0.972	5513	1748	9600	2100	0.66	0.83	63.1	60.3	21.8	25.3	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	5513	9600	0.64	69.6	19.8	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.4	16.3	15.8	6.1	B

Facility Overall Results

Space Mean Speed, mi/h	68.4	Density, veh/mi/ln	15.8
Average Travel Time, min	6.1		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	AM Peak - SB
Analysis Year	2040 - No Build AM	Date	6/8/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	11
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	11730	4
6	Diverge	Diverge	f->g	1500	4
7	Basic	Basic	g->h	2550	4
8	Merge	Merge	h->i	1500	4
9	Basic	Basic	i->j	600	4
10	Merge	Merge	j->k	1500	4
11	Basic	Basic	l->m	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	5659	9600	0.59	69.5	20.4	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.74	0.970	0.972	5659	1536	9600	2100	0.59	0.73	65.5	59.6	21.6	28.2	D

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	4447	9600	0.46	70.0	15.9	B

Segment 4: Merge

Time	PHF	fHV	Flow Rate	Capacity	d/c	Speed	Density	LOS

Period					(pc/h)		(pc/h)		Ratio		(mi/h)		(pc/mi/ln)		
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.970	0.953	5384	937	9600	2100	0.56	0.45	64.3	61.8	20.9	20.7	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	5270	9600	0.55	69.8	18.9	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.95	0.970	0.975	5270	1754	9600	2100	0.55	0.84	64.7	59.1	20.4	25.9	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3452	9600	0.36	70.0	12.3	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	4772	1320	9600	2000	0.50	0.66	64.4	61.9	18.5	16.5	B

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4592	9600	0.48	70.0	16.4	B

Segment 10: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	6377	1785	9600	2100	0.66	0.85	63.3	60.8	25.2	24.1	C

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	6133	9600	0.64	68.7	22.3	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.5	19.3	18.8	6.1	C

Facility Overall Results

Space Mean Speed, mi/h	68.5	Density, veh/mi/ln	18.8
Average Travel Time, min	6.1		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	PM Peak - NB
Analysis Year	2040 No Build PM - NB	Date	6/8/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	9
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	11825	4
6	Diverge	Diverge	f->g	1500	4
7	Basic	Basic	g->h	4100	4
8	Merge	Merge	h->i	1500	4
9	Basic	Basic	i->j	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	6085	9600	0.63	68.8	22.1	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.92	0.979	0.991	6085	2561	9600	4200	0.63	0.61	63.7	57.0	23.9	12.3	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3548	9600	0.37	70.0	12.7	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	

1	0.94	0.87	0.979	0.988	5619	2071	9600	2100	0.59	0.99	63.7	61.3	22.1	23.0	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5449	9600	0.57	69.7	19.5	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.67	0.985	0.964	5449	1037	9600	2100	0.57	0.49	66.9	60.9	20.4	25.4	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	4725	9600	0.49	70.0	16.9	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.985	0.988	6033	1308	9600	2100	0.63	0.62	63.3	60.5	23.8	25.1	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5967	9600	0.62	69.0	21.6	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.6	19.6	19.2	6.1	C

Facility Overall Results

Space Mean Speed, mi/h	68.6	Density, veh/mi/ln	19.2
Average Travel Time, min	6.1		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	PM Peak - SB
Analysis Year	2040 No Build - PM	Date	6/10/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	11
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	11730	4
6	Diverge	Diverge	f->g	1500	4
7	Basic	Basic	g->h	2550	4
8	Merge	Merge	h->i	1500	4
9	Basic	Basic	i->j	600	4
10	Merge	Merge	j->k	1500	4
11	Basic	Basic	l->m	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.982	6186	9600	0.64	68.6	22.5	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.982	0.979	6186	1555	9600	2100	0.64	0.74	65.4	59.6	23.6	30.3	D

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.982	4631	9600	0.49	70.0	16.5	B

Segment 4: Merge

Time	PHF	fHV	Flow Rate	Capacity	d/c	Speed	Density	LOS

Period					(pc/h)		(pc/h)		Ratio		(mi/h)		(pc/mi/ln)		
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.982	0.978	5426	795	9600	2100	0.57	0.38	64.3	61.9	21.1	20.2	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.982	5426	9600	0.56	69.7	19.5	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.92	0.982	0.986	5426	2315	9600	2100	0.56	1.10	53.3	57.7	45.0	29.2	D

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3111	9600	0.33	70.0	11.1	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	3715	604	9600	2000	0.39	0.30	65.5	62.8	14.2	10.2	B

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3715	9600	0.38	70.0	13.3	B

Segment 10: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	4549	834	9600	2100	0.47	0.40	65.7	63.8	17.3	14.4	B

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4549	9600	0.46	70.0	16.2	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.3	19.4	19.1	6.1	C

Facility Overall Results

Space Mean Speed, mi/h	68.3	Density, veh/mi/ln	19.1
Average Travel Time, min	6.1		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	AM Peak - NB w/Overlap
Analysis Year	2040 4A South Alt. A - AM-NB	Date	6/30/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	13
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a>b	5280	4
2	Diverge	Diverge	b>c	1500	4
3	Basic	Basic	c>d	4525	4
4	Merge	Merge	d>e	1500	4
5	Overlap	Basic	e>f	700	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	3310	4
8	Merge	Merge	h>i	1500	4
9	Basic	Basic	i>j	6215	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	4100	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3662	9600	0.38	70.0	13.1	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.77	0.979	0.964	3662	977	9600	4200	0.38	0.23	68.7	61.0	13.3	-3.2	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	2874	9600	0.30	70.0	10.3	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.90	0.979	0.983	4733	1859	9600	2100	0.49	0.89	64.8	62.7	18.3	19.3	B

Segment 5: Overlap

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	4662	9600	0.49	64.8	18.3	B

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.964	0.969	4734	1013	9600	2100	0.49	0.48	67.0	60.9	17.7	20.2	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	3857	9600	0.40	70.0	13.8	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.964	0.969	5628	1771	9600	2100	0.59	0.84	63.2	60.5	22.3	24.9	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	5391	9600	0.56	69.7	19.3	C

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.75	0.964	0.956	5391	907	9600	2100	0.56	0.43	67.3	61.2	20.0	24.5	C

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	4674	9600	0.49	70.0	16.7	B

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.83	0.964	0.972	6081	1407	9600	2100	0.63	0.67	63.1	60.2	24.1	25.7	C

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	5926	9600	0.62	69.1	21.4	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.5	16.9	16.4	6.4	B

Facility Overall Results

Space Mean Speed, mi/h	68.5	Density, veh/mi/ln	16.4
Average Travel Time, min	6.4		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	AM Peak - SB
Analysis Year	2040 - 4A South Alt. A AM - SB Overlap	Date	6/30/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	7615	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	3165	4
8	Merge	Merge	h>i4A on ramp	1500	4
9	Overlap	Basic	i>j	650	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	2650	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	1580	4
14	Merge	Merge	l>m	1500	4
15	Basic	Basic	m>n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	5994	9600	0.62	69.0	21.7	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.74	0.970	0.972	5994	869	9600	2100	0.62	0.41	67.3	61.3	22.3	24.2	C

Segment 3: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.970		5125		9600		0.55		69.9		18.3		C
Segment 4: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.84	0.970	0.953	6218	1093	9600	2100	0.67	0.52	64.3	62.5	24.2	20.6	C
Segment 5: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.970		6218		9600		0.65		68.5		22.7		C
Segment 6: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.80	0.970	0.965	6218	2241	9600	2100	0.65	1.07	53.3	57.8	45.0	33.9	D
Segment 7: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.964		3977		9600		0.46		70.0		14.2		B
Segment 8: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.80	0.970	0.965	5246	1269	9600	2100	0.59	0.60	64.0	61.3	20.5	22.2	C
Segment 9: Overlap															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.970		5246		9600		0.57		64.0		20.5		C
Segment 10: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.80	0.970	0.965	5246	1587	9600	2100	0.57	0.76	65.3	59.5	20.1	24.4	C
Segment 11: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.970		3659		9600		0.43		70.0		13.1		B
Segment 12: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	4350	691	9600	2000	0.49	0.35	65.1	62.6	16.7	12.6	B

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4350	9600	0.49	70.0	15.5	B

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	6311	1961	9600	2100	0.69	0.93	63.1	60.5	25.0	24.7	C

Segment 15: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	6311	9600	0.66	68.3	23.1	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	67.4	21.1	20.6	6.9	C

Facility Overall Results

Space Mean Speed, mi/h	67.4	Density, veh/mi/ln	20.6
Average Travel Time, min	6.9		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	AM Peak - SB
Analysis Year	2040 - 4A South Alt. A AM - SB Overlap	Date	6/30/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	7615	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	3165	4
8	Merge	Basic	h>i4A on ramp	1500	3
9	Overlap	Basic	i>j	650	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	2650	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	1580	4
14	Merge	Merge	l>m	1500	4
15	Basic	Basic	m>n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	5994	9600	0.62	69.0	21.7	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.74	0.970	0.972	5994	869	9600	2100	0.62	0.41	67.3	61.3	22.3	24.2	C

Segment 3: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.970		5308		9600		0.55		69.8		19.0		C
Segment 4: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.84	0.970	0.953	6401	1093	9600	2100	0.67	0.52	64.1	62.3	25.0	21.2	C
Segment 5: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.970		6268		9600		0.65		68.4		22.9		C
Segment 6: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.80	0.970	0.965	6268	2241	9600	4200	0.65	0.53	64.8	57.8	24.2	16.3	B
Segment 7: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.964		4398		9600		0.46		70.0		15.7		B
Segment 8: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.80	0.970	0.965	5639	1269	7200	2100	0.61	0.60	69.2	57.9	21.1	30.2	C
Segment 9: Overlap															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.970		5445		9600		0.57		69.2		21.1		C
Segment 10: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.80	0.970	0.965	5445	1587	9600	2100	0.57	0.76	65.3	59.5	20.8	25.2	C
Segment 11: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.970		4102		9600		0.43		70.0		14.7		B
Segment 12: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	4751	691	9600	2000	0.49	0.35	64.9	62.4	18.3	13.8	B

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4657	9600	0.49	70.0	16.6	B

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	6618	1961	9600	2100	0.69	0.93	62.6	59.9	26.4	25.6	C

Segment 15: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	6350	9600	0.66	68.3	23.3	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.0	21.0	20.4	6.8	C

Facility Overall Results

Space Mean Speed, mi/h	68.0	Density, veh/mi/ln	20.4
Average Travel Time, min	6.8		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	PM Peak - NB Overlap
Analysis Year	2040 4A South Alt. A - PM-NB	Date	6/30/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	13
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d>e	1500	4
5	Overlap	Basic	e>f	700	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g > h	3310	4
8	Merge	Merge	h > j	1500	4
9	Basic	Basic	i > j	6215	4
10	Diverge	Diverge	j > k	1500	4
11	Basic	Basic	k > l	4100	4
12	Merge	Merge	l > m	1500	4
13	Basic	Basic	m > n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	6303	9600	0.66	68.4	23.0	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.77	0.979	0.964	6303	2809	9600	4200	0.66	0.67	63.0	56.4	25.0	14.4	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	4037	9600	0.42	70.0	14.4	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.87	0.979	0.988	5509	1472	9600	2100	0.57	0.70	64.6	62.6	21.3	20.1	C

Segment 5: Overlap

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	5412	9600	0.56	64.6	21.3	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.979	0.983	5412	860	9600	2100	0.56	0.41	67.4	61.3	20.1	24.3	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	4612	9600	0.48	70.0	16.5	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	1.000	0.983	6045	1502	9600	2100	0.63	0.72	63.2	60.5	23.9	25.1	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5951	9600	0.62	69.0	21.6	C

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.67	0.964	0.964	6081	1215	9600	2100	0.63	0.58	66.3	60.4	22.9	28.6	D

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5103	9600	0.53	69.9	18.3	C

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.964	0.988	6266	1052	9600	2100	0.65	0.50	63.3	60.6	24.7	24.8	C

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	6235	9600	0.65	68.5	22.8	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	67.9	20.6	20.2	6.4	C

Facility Overall Results

Space Mean Speed, mi/h	67.9	Density, veh/mi/ln	20.2
Average Travel Time, min	6.4		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	PM Peak - SB
Analysis Year	2040 - 4A South Alt. A PM - SB Overlap	Date	6/30/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	7615	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	3165	4
8	Merge	Merge	h>i	1500	4
9	Overlap	Basic	i>j	650	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	2650	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	600	4
14	Merge	Merge	n>o	1500	4
15	Basic	Basic	o>p	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.982	5931	9600	0.62	69.1	21.5	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.982	0.979	5931	883	9600	2100	0.62	0.42	67.2	61.3	22.1	24.0	C

Segment 3: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.982		5102		9600		0.53		69.9		18.3		C
Segment 4: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.81	0.970	0.978	6094	928	9600	2100	0.63	0.44	64.5	62.8	23.6	19.5	B
Segment 5: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.982		5899		9600		0.61		69.1		21.3		C
Segment 6: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.84	0.982	0.979	5899	1879	9600	2100	0.61	0.89	64.4	58.7	22.9	31.0	D
Segment 7: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.982		4225		9600		0.44		75.3		14.0		B
Segment 8: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.84	0.982	0.979	5289	1064	9600	2100	0.55	0.51	64.2	61.6	20.6	21.4	C
Segment 9: Overlap															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.982		5173		9600		0.54		64.2		20.6		C
Segment 10: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.84	0.982	0.979	5173	1921	9600	2100	0.54	0.91	64.0	58.6	20.2	26.4	C
Segment 11: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.980		3468		9600		0.36		70.0		12.4		B
Segment 12: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	3785	317	9600	2000	0.39	0.16	65.7	62.9	14.4	9.2	A

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3745	9600	0.39	70.0	13.4	B

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	4660	915	9600	2100	0.49	0.44	65.2	62.9	17.9	15.1	B

Segment 15: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4543	9600	0.47	70.0	16.2	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.6	18.8	18.4	6.6	C

Facility Overall Results

Space Mean Speed, mi/h	68.6	Density, veh/mi/ln	18.4
Average Travel Time, min	6.6		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	AM Peak - NB w/Overlap
Analysis Year	2040 4A South Alt. B - AM-NB	Date	6/30/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	13
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a>b	5280	4
2	Diverge	Diverge	b>c	1500	4
3	Basic	Basic	c>d	4525	4
4	Merge	Merge	d>e	1500	4
5	Overlap	Basic	e>f	700	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	3310	4
8	Merge	Merge	h>i	1500	4
9	Basic	Basic	i>j	6215	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	4100	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3673	9600	0.38	70.0	13.1	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.77	0.979	0.964	3673	983	9600	4200	0.38	0.23	68.7	61.0	13.4	-3.1	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	2690	9600	0.30	70.0	9.6	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.90	0.979	0.983	4790	2165	9600	2100	0.53	1.03	53.3	62.2	45.0	20.8	C

Segment 5: Overlap

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	4790	9600	0.52	53.3	45.0	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.964	0.969	4790	1102	9600	2100	0.52	0.52	66.7	60.7	18.0	23.2	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	3688	9600	0.43	70.0	13.2	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.964	0.969	5223	1535	9600	2100	0.59	0.73	63.9	61.3	20.4	22.7	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	5223	9600	0.56	69.9	18.7	C

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.75	0.964	0.956	5223	851	9600	2100	0.56	0.41	67.4	61.3	19.4	23.6	C

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	4372	9600	0.49	70.0	15.6	B

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.83	0.964	0.972	5729	1357	9600	2100	0.64	0.65	63.5	60.7	22.6	24.4	C

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	5729	9600	0.62	69.4	20.6	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	67.6	17.8	17.3	6.5	B

Facility Overall Results

Space Mean Speed, mi/h	67.6	Density, veh/mi/ln	17.3
Average Travel Time, min	6.5		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	AM Peak - SB
Analysis Year	2040 - 4A South Alt. B AM - SB Overlap	Date	6/30/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	7615	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	3165	4
8	Merge	Merge	h>i4A on ramp	1500	4
9	Overlap	Basic	i>j	650	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	2650	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	600	4
14	Merge	Merge	l>m	1500	4
15	Basic	Basic	m>n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	6043	9600	0.63	68.9	21.9	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.74	0.970	0.972	6043	681	9600	2100	0.63	0.32	67.7	61.8	22.3	23.5	C

Segment 3: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.970		5362		9600		0.57		69.8		19.2		C
Segment 4: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.84	0.970	0.953	6211	849	9600	2100	0.66	0.40	64.4	62.8	24.1	19.5	B
Segment 5: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.970		6211		9600		0.65		68.6		22.6		C
Segment 6: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.80	0.970	0.965	6211	2293	9600	2100	0.65	1.09	53.3	57.7	45.0	34.2	D
Segment 7: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.964		3918		9600		0.45		70.0		14.0		B
Segment 8: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.80	0.970	0.965	5388	1470	9600	2100	0.60	0.70	63.7	61.0	21.1	23.5	C
Segment 9: Overlap															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.970		5388		9600		0.58		63.7		21.1		C
Segment 10: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.80	0.970	0.965	5388	1697	9600	2100	0.58	0.81	64.9	59.2	20.8	25.5	C
Segment 11: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.970		3691		9600		0.43		70.0		13.2		B
Segment 12: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	4426	735	9600	2000	0.50	0.37	65.0	62.5	17.0	13.0	B

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4426	9600	0.49	70.0	15.8	B

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	6356	1930	9600	2100	0.69	0.92	63.1	60.5	25.2	24.7	C

Segment 15: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	6356	9600	0.66	68.2	23.3	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	67.3	21.5	20.9	6.7	C

Facility Overall Results

Space Mean Speed, mi/h	67.3	Density, veh/mi/ln	20.9
Average Travel Time, min	6.7		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	PM Peak - NB Overlap
Analysis Year	2040 4A South Alt. B - PM-NB	Date	6/30/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	13
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d>e	1500	4
5	Overlap	Basic	e>f	700	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g > h	3310	4
8	Merge	Merge	h > j	1500	4
9	Basic	Basic	i > j	6215	4
10	Diverge	Diverge	j > k	1500	4
11	Basic	Basic	k > l	4100	4
12	Merge	Merge	l > m	1500	4
13	Basic	Basic	m > n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	6324	9600	0.66	68.3	23.1	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.77	0.979	0.964	6324	2822	9600	4200	0.66	0.67	63.0	56.4	25.1	14.5	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	4048	9600	0.42	70.0	14.5	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.87	0.979	0.988	5758	1710	9600	2100	0.60	0.81	64.1	61.9	22.5	21.9	C

Segment 5: Overlap

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	5645	9600	0.59	64.1	22.5	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.979	0.983	5645	933	9600	2100	0.59	0.44	67.1	61.1	21.0	23.2	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	4779	9600	0.50	70.0	17.1	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	1.000	0.983	6009	1302	9600	2100	0.63	0.62	63.5	60.9	23.7	24.1	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5940	9600	0.62	69.1	21.5	C

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.67	0.964	0.964	6070	1138	9600	2100	0.63	0.54	66.6	60.6	22.8	28.2	D

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5146	9600	0.54	69.9	18.4	C

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.964	0.988	6276	1018	9600	2100	0.65	0.48	63.2	60.6	24.8	24.6	C

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	6246	9600	0.65	68.5	22.8	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	67.9	20.8	20.4	6.4	C

Facility Overall Results

Space Mean Speed, mi/h	67.9	Density, veh/mi/ln	20.4
Average Travel Time, min	6.4		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	PM Peak - SB
Analysis Year	2040 - 4A South Alt. B PM - SB Overlap	Date	6/30/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	7615	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	3990	4
8	Merge	Basic	h>i	1500	3
9	Overlap	Basic	i>j	650	4
10	Diverge	Diverge	j>k	1500	3
11	Basic	Basic	k>l	2325	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	600	4
14	Merge	Merge	n>o	1500	4
15	Basic	Basic	o>p	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.982	5947	9600	0.62	69.0	21.6	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.982	0.979	5947	693	9600	2100	0.62	0.33	67.6	61.7	22.0	23.2	C

Segment 3: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.982		5297		9600		0.55		69.8		19.0		C
Segment 4: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.81	0.970	0.978	6083	720	9600	2100	0.63	0.34	64.6	63.1	23.5	18.6	B
Segment 5: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.982		5915		9600		0.62		69.1		21.4		C
Segment 6: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.84	0.982	0.979	5915	1915	9600	2100	0.62	0.91	64.4	58.7	23.0	31.2	D
Segment 7: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.982		4209		9600		0.44		70.0		15.0		B
Segment 8: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.84	0.982	0.979	5437	1228	7200	2100	0.58	0.58	69.5	58.6	20.2	29.1	C
Segment 9: Overlap															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.982		5303		9600		0.55		62.2		28.4		D
Segment 10: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.84	0.982	0.979	5303	2055	7200	2100	0.74	0.98	62.2	58.3	28.4	30.2	D
Segment 11: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.980		3479		9600		0.36		70.0		12.4		B
Segment 12: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	3815	336	9600	2000	0.40	0.17	65.6	62.9	14.5	9.4	A

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3772	9600	0.39	70.0	13.5	B

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	4674	902	9600	2100	0.49	0.43	65.1	62.9	17.9	15.1	B

Segment 15: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4559	9600	0.47	70.0	16.3	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.4	19.3	18.9	6.7	C

Facility Overall Results

Space Mean Speed, mi/h	68.4	Density, veh/mi/ln	18.9
Average Travel Time, min	6.7		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	AM Peak - NB
Analysis Year	2040 4A North Alt. C - AM-NB	Date	6/30/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	13
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	4497	4
6	Diverge	Diverge	f > g	1500	4
7	Basic	Basic	g > h	2702	4
8	Merge	Merge	h > j	1500	4
9	Basic	Basic	i > j	1626	4
10	Diverge	Diverge	j > k	1500	4
11	Basic	Basic	k > l	4100	4
12	Merge	Merge	l > m	1500	4
13	Basic	Basic	m > n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3548	9600	0.37	70.0	12.7	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.77	0.979	0.964	3548	1017	9600	4200	0.37	0.24	68.4	60.9	13.0	-3.2	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	2727	9600	0.28	70.0	9.7	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.90	0.979	0.983	4677	1950	9600	2100	0.49	0.93	64.7	62.6	18.1	19.5	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	4674	9600	0.49	70.0	16.7	B

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.964	0.969	4674	325	9600	2100	0.49	0.15	69.0	62.7	16.9	19.0	B

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	4392	9600	0.46	70.0	15.7	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.964	0.969	5953	1561	9600	2100	0.62	0.74	64.1	61.9	23.2	21.9	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	5744	9600	0.60	69.4	20.7	C

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.95	0.75	0.964	0.956	5684	802	9600	2000	0.59	0.40	63.9	56.0	22.2	25.1	C

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	5109	9600	0.53	69.9	18.3	C

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.83	0.964	0.972	6125	1016	9600	2100	0.64	0.48	63.3	60.6	24.2	24.2	C

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	6014	9600	0.63	68.9	21.8	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.4	17.0	16.4	6.1	B

Facility Overall Results

Space Mean Speed, mi/h	68.4	Density, veh/mi/ln	16.4
Average Travel Time, min	6.1		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	AM Peak - SB
Analysis Year	2040 4A North Alt C AM - SB	Date	7/6/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	2705	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	2850	4
8	Merge	Merge	h>i	1500	4
9	Basic	Basic	i>j	4675	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	2550	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	600	4
14	Merge	Merge	n>o	1500	4
15	Basic	Basic	o>p	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	5994	9600	0.62	69.0	21.7	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.74	0.970	0.972	5994	646	9600	2100	0.62	0.31	67.8	61.9	22.1	25.2	C

Segment 3: Basic

Time	PHF	fHV	Flow Rate	Capacity	d/c	Speed	Density	LOS

Period			(pc/h)		(pc/h)		Ratio		(mi/h)		(pc/mi/ln)		
1	0.94		0.970		5484		9600		0.57		69.7		19.7	C

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.970	0.953	6421	937	9600	2100	0.67	0.45	63.4	61.0	25.3	23.9	C

Segment 5: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.970		6306		9600		0.66		68.4		23.0		C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.970	0.967	6306	1939	9600	2100	0.66	0.92	64.3	58.6	24.5	32.9	D

Segment 7: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.970		4579		9600		0.48		70.0		16.4		B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	1.000	0.967	5007	566	9600	2100	0.52	0.27	65.5	63.8	19.1	14.7	B

Segment 9: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.980		5031		9600		0.52		70.0		18.0		B

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.95	0.970	0.975	5083	1215	9600	1900	0.53	0.64	59.7	51.3	21.3	22.5	C

Segment 11: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.980		3810		9600		0.40		70.0		13.6		B

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	4728	918	9600	2000	0.49	0.46	64.7	62.1	18.3	15.5	B

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4603	9600	0.48	70.0	16.4	B

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	6401	1798	9600	2100	0.67	0.86	63.3	60.8	25.3	24.3	C

Segment 15: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	6155	9600	0.64	68.7	22.4	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	67.9	20.4	19.9	6.4	C

Facility Overall Results

Space Mean Speed, mi/h	67.9	Density, veh/mi/ln	19.9
Average Travel Time, min	6.4		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	PM Peak - NB
Analysis Year	2040 4A North Alt. C - PM-NB	Date	6/30/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	13
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	4497	4
6	Diverge	Diverge	f > g	1500	4
7	Basic	Basic	g > h	2702	4
8	Merge	Merge	h > j	1500	4
9	Basic	Basic	i > j	1626	4
10	Diverge	Diverge	j > k	1500	4
11	Basic	Basic	k > l	4100	4
12	Merge	Merge	l > m	1500	4
13	Basic	Basic	m > n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	6112	9600	0.64	68.8	22.2	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.92	0.979	0.991	6112	2369	9600	4200	0.64	0.56	64.4	57.5	23.7	11.1	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3765	9600	0.39	70.0	13.4	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.87	0.979	0.988	5306	1541	9600	2100	0.55	0.73	64.7	62.6	20.5	19.8	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5173	9600	0.54	69.9	18.5	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.985	0.983	5173	279	9600	2100	0.54	0.13	68.9	62.8	18.8	20.6	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	4925	9600	0.51	70.0	17.6	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.985	0.983	6245	1320	9600	2100	0.65	0.63	64.1	62.0	24.4	21.8	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	6102	9600	0.64	68.8	22.2	C

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.67	0.985	0.964	6102	1068	9600	2100	0.64	0.51	66.7	60.8	22.9	28.0	C

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5357	9600	0.56	69.8	19.2	C

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.985	0.988	6119	762	9600	2100	0.64	0.36	63.6	61.1	24.1	23.1	C

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	6081	9600	0.63	68.8	22.1	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.3	20.0	19.7	6.2	C

Facility Overall Results

Space Mean Speed, mi/h	68.3	Density, veh/mi/ln	19.7
Average Travel Time, min	6.2		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	PM Peak - SB
Analysis Year	2040 4A North Alt C PM - SB	Date	7/6/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	2705	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	2850	4
8	Merge	Merge	h>i	1500	4
9	Basic	Basic	i>j	4675	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	2550	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	600	4
14	Merge	Merge	n>o	1500	4
15	Basic	Basic	o>p	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.982	5877	9600	0.61	69.2	21.2	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.982	0.979	5877	658	9600	2100	0.61	0.31	67.7	61.8	21.7	24.8	C

Segment 3: Basic

Time	PHF	fHV	Flow Rate	Capacity	d/c	Speed	Density	LOS

Period			(pc/h)		(pc/h)		Ratio		(mi/h)		(pc/mi/ln)		
1	0.94		0.982		5260		9600		0.55		69.8		18.8	C

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.982	0.978	6055	795	9600	2100	0.63	0.38	63.8	61.5	23.7	22.2	C

Segment 5: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.970		6016		9600		0.63		68.9		21.8		C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.86	0.982	0.981	5942	1665	9600	2100	0.62	0.79	65.1	59.3	22.8	30.2	D

Segment 7: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.982		4420		9600		0.46		70.0		15.8		B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.86	0.982	0.981	4906	486	9600	2100	0.51	0.23	65.5	63.9	18.7	14.1	B

Segment 9: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.980		4874		9600		0.51		70.0		17.4		B

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.92	0.980	0.986	4874	1598	9600	2100	0.51	0.76	65.0	59.4	18.7	23.6	C

Segment 11: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.980		3300		9600		0.34		70.0		11.8		B

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	3723	423	9600	2000	0.39	0.21	65.5	62.7	14.2	10.2	B

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3669	9600	0.38	70.0	13.1	B

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	4509	840	9600	2100	0.47	0.40	65.7	63.8	17.2	14.3	B

Segment 15: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4402	9600	0.46	70.0	15.7	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.5	18.2	17.8	6.4	C

Facility Overall Results

Space Mean Speed, mi/h	68.5	Density, veh/mi/ln	17.8
Average Travel Time, min	6.4		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	AM Peak - NB
Analysis Year	2040 4A North Alt D - AM - NB	Date	6/20/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	13
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	4497	4
6	Diverge	Diverge	f > g	1500	4
7	Basic	Basic	g > h	2702	4
8	Merge	Merge	h > j	1500	4
9	Basic	Basic	i > j	1626	4
10	Diverge	Diverge	j > k	1500	4
11	Basic	Basic	k > l	4100	4
12	Merge	Merge	l > m	1500	4
13	Basic	Basic	m > n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3548	9600	0.37	70.0	12.7	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.77	0.979	0.964	3548	1058	9600	4200	0.37	0.25	68.2	60.8	13.0	-2.9	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.94		0.979		2695		9600		0.28		70.0		9.6		A
Segment 4: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.90	0.979	0.983	4583	1888	9600	2100	0.48	0.90	64.8	62.8	17.7	19.0	B
Segment 5: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.964		4580		9600		0.48		70.0		16.4		B
Segment 6: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.81	0.964	0.969	4580	172	9600	2100	0.48	0.08	69.4	63.1	16.5	17.9	B
Segment 7: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.964		4431		9600		0.46		70.0		15.8		B
Segment 8: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.81	0.964	0.969	6017	1586	9600	2100	0.63	0.76	64.0	61.8	23.5	22.2	C
Segment 9: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.964		5805		9600		0.60		69.3		20.9		C
Segment 10: Diverge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	
1	0.94	0.75	0.964	0.956	5805	851	9600	2100	0.60	0.41	67.3	61.3	21.6	25.8	C
Segment 11: Basic															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
1	0.94		0.964		5132		9600		0.53		69.9		18.4		C
Segment 12: Merge															
Time Period	**PHF**		**fHV**		**Flow Rate (pc/h)**		**Capacity (pc/h)**		**d/c Ratio**		**Speed (mi/h)**		**Density (pc/mi/ln)**		**LOS**
	F	**R**	**F**	**R**	**Freeway**	**Ramp**	**Freeway**	**Ramp**	**F**	**R**	**F**	**R**	**Freeway**	**Ramp**	

1	0.94	0.83	0.964	0.972	6167	1035	9600	2100	0.64	0.49	63.4	60.7	24.3	24.4	C

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	6053	9600	0.63	68.9	22.0	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.6	17.0	16.4	6.1	B

Facility Overall Results

Space Mean Speed, mi/h	68.6	Density, veh/mi/ln	16.4
Average Travel Time, min	6.1		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	AM Peak - SB
Analysis Year	2040 4A North Alt D AM - SB	Date	7/6/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	2705	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	2850	4
8	Merge	Merge	h>i	1500	4
9	Basic	Basic	i>j	4675	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	2550	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	600	4
14	Merge	Merge	n>o	1500	4
15	Basic	Basic	o>p	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	5994	9600	0.62	69.0	21.7	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.74	0.970	0.972	5994	653	9600	2100	0.62	0.31	67.7	61.8	22.1	25.2	C

Segment 3: Basic

Time	PHF	fHV	Flow Rate	Capacity	d/c	Speed	Density	LOS

Period			(pc/h)		(pc/h)		Ratio		(mi/h)		(pc/mi/ln)		
1	0.94	0.970	5478		9600		0.57		69.7		19.7		C

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.970	0.953	6409	931	9600	2100	0.67	0.44	63.4	61.0	25.3	23.9	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	6295	9600	0.66	68.4	23.0	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.970	0.967	6295	1908	9600	2100	0.66	0.91	64.4	58.7	24.4	32.7	D

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	4595	9600	0.48	70.0	16.4	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	1.000	0.967	4974	517	9600	2100	0.52	0.25	65.5	63.8	19.0	14.4	B

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	5004	9600	0.52	70.0	17.9	B

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.95	0.970	0.975	5056	1188	9600	1900	0.53	0.63	59.9	51.4	21.1	22.3	C

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3810	9600	0.40	70.0	13.6	B

Segment 12: Merge

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	4728	918	9600	2000	0.49	0.46	64.7	62.1	18.3	15.5	B

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4603	9600	0.48	70.0	16.4	B

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	6388	1785	9600	2100	0.67	0.85	63.3	60.8	25.2	24.2	C

Segment 15: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	6144	9600	0.64	68.7	22.4	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	67.9	20.3	19.8	6.4	C

Facility Overall Results

Space Mean Speed, mi/h	67.9	Density, veh/mi/ln	19.8
Average Travel Time, min	6.4		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	PM Peak - NB
Analysis Year	2040 4A North Alt D - PM-NB	Date	6/20/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	13
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	4497	4
6	Diverge	Diverge	f > g	1500	4
7	Basic	Basic	g > h	2702	4
8	Merge	Merge	h > j	1500	4
9	Basic	Basic	i > j	1626	4
10	Diverge	Diverge	j > k	1500	4
11	Basic	Basic	k > l	4100	4
12	Merge	Merge	l > m	1500	4
13	Basic	Basic	m > n	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	6112	9600	0.64	68.8	22.2	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.92	0.979	0.991	6112	2468	9600	4200	0.64	0.59	64.1	57.3	23.8	11.6	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3667	9600	0.38	70.0	13.1	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.87	0.979	0.988	5162	1495	9600	2100	0.54	0.71	64.8	62.8	19.9	19.1	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5033	9600	0.52	70.0	18.0	B

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.985	0.983	5033	145	9600	2100	0.52	0.07	69.2	63.1	18.2	19.5	B

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	4903	9600	0.51	70.0	17.5	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.985	0.983	6247	1344	9600	2100	0.65	0.64	64.0	62.0	24.4	21.9	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	6102	9600	0.64	68.8	22.2	C

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.67	0.985	0.964	6102	1146	9600	2100	0.64	0.55	66.5	60.6	22.9	28.4	D

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5303	9600	0.55	69.8	19.0	C

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.83	0.985	0.988	6132	829	9600	2100	0.64	0.39	63.5	61.0	24.1	23.4	C

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	6037	9600	0.63	68.9	21.9	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.4	19.8	19.5	6.2	C

Facility Overall Results

Space Mean Speed, mi/h	68.4	Density, veh/mi/ln	19.5
Average Travel Time, min	6.2		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	PM Peak - SB
Analysis Year	2040 4A North Alt D PM - SB	Date	7/6/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	15
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	2705	4
6	Diverge	Diverge	f>g	1500	4
7	Basic	Basic	g>h	2850	4
8	Merge	Merge	h>i	1500	4
9	Basic	Basic	i>j	4675	4
10	Diverge	Diverge	j>k	1500	4
11	Basic	Basic	k>l	2550	4
12	Merge	Merge	l>m	1500	4
13	Basic	Basic	m>n	600	4
14	Merge	Merge	n>o	1500	4
15	Basic	Basic	o>p	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.982	5872	9600	0.61	69.2	21.2	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.982	0.979	5872	664	9600	2100	0.61	0.32	67.8	61.8	21.7	24.8	C

Segment 3: Basic

Time	PHF	fHV	Flow Rate	Capacity	d/c	Speed	Density	LOS

Period			(pc/h)		(pc/h)		Ratio		(mi/h)		(pc/mi/ln)		
1	0.94		0.982		5249		9600		0.55		69.9		18.8	C

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.982	0.978	6038	789	9600	2100	0.63	0.38	63.8	61.5	23.7	22.1	C

Segment 5: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.970		5999		9600		0.62		69.0		21.7		C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.86	0.982	0.981	5926	1636	9600	2100	0.62	0.78	65.2	59.4	22.7	30.0	D

Segment 7: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.982		4431		9600		0.46		70.0		15.8		B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.86	0.982	0.981	4875	444	9600	2100	0.51	0.21	65.6	63.9	18.6	13.8	B

Segment 9: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.980		4847		9600		0.50		70.0		17.3		B

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.92	0.980	0.986	4847	1565	9600	2100	0.50	0.75	65.1	59.5	18.6	23.4	C

Segment 11: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.94		0.980		3305		9600		0.34		70.0		11.8		B

Segment 12: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	3728	423	9600	2000	0.39	0.21	65.5	62.7	14.2	10.3	B

Segment 13: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3675	9600	0.38	70.0	13.1	B

Segment 14: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	4515	840	9600	2100	0.47	0.40	65.7	63.8	17.2	14.3	B

Segment 15: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4407	9600	0.46	70.0	15.7	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.6	18.2	17.8	6.4	C

Facility Overall Results

Space Mean Speed, mi/h	68.6	Density, veh/mi/ln	17.8
Average Travel Time, min	6.4		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	AM Peak - NB
Analysis Year	2040 Alternative F - AM-NB	Date	6/8/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	9
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	11825	4
6	Diverge	Diverge	f->g	1500	4
7	Basic	Basic	g->h	4100	4
8	Merge	Merge	h->i	1500	4
9	Basic	Basic	i->j	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3542	9600	0.37	70.0	12.7	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.77	0.979	0.964	3542	1105	9600	4200	0.37	0.26	68.0	60.7	13.0	-2.6	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	2437	9600	0.28	70.0	8.7	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	

1	0.94	0.90	0.973	0.983	4537	2622	9600	2100	0.55	1.25	53.3	61.7	45.0	21.9	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	4537	9600	0.55	70.0	16.2	B

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.75	0.964	0.956	4537	753	9600	2100	0.55	0.36	67.8	61.6	16.7	20.6	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	3784	9600	0.49	70.0	13.5	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.83	0.964	0.972	5513	1729	9600	2100	0.67	0.82	63.1	60.3	21.8	25.3	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.964	5513	9600	0.65	69.6	19.8	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.4	16.3	15.8	6.1	B

Facility Overall Results

Space Mean Speed, mi/h	68.4	Density, veh/mi/ln	15.8
Average Travel Time, min	6.1		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	AM Peak - SB
Analysis Year	2040 - Alternative F AM-SB	Date	6/18/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	11
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	11730	4
6	Diverge	Diverge	f->g	1500	4
7	Basic	Basic	g->h	2550	4
8	Merge	Merge	h->i	1500	4
9	Basic	Basic	i->j	600	4
10	Merge	Merge	j->k	1500	4
11	Basic	Basic	l->m	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	5582	9600	0.58	69.6	20.1	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.74	0.970	0.972	5582	1383	9600	2100	0.58	0.66	65.9	60.0	21.2	25.1	C

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	4491	9600	0.47	70.0	16.0	B

Segment 4: Merge

Time	PHF	fHV	Flow Rate	Capacity	d/c	Speed	Density	LOS

Period					(pc/h)		(pc/h)		Ratio		(mi/h)		(pc/mi/ln)		
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.84	0.970	0.953	5428	937	9600	2100	0.57	0.45	64.8	62.9	20.9	17.5	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.970	5314	9600	0.55	69.8	19.0	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.95	0.970	0.975	5314	1792	9600	2100	0.55	0.85	64.6	59.0	20.6	26.2	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3457	9600	0.36	70.0	12.3	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	4796	1339	9600	2000	0.50	0.67	64.3	61.7	18.6	17.5	B

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4614	9600	0.48	70.0	16.5	B

Segment 10: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.970	6387	1773	9600	2100	0.67	0.84	62.8	60.1	25.4	24.2	C

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	6144	9600	0.64	68.7	22.4	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.5	19.3	18.8	6.1	C

Facility Overall Results

Space Mean Speed, mi/h	68.5	Density, veh/mi/ln	18.8
Average Travel Time, min	6.1		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	CLD
Jurisdiction		Time Period Analyzed	PM Peak - NB
Analysis Year	2040 Alternative F PM - NB	Date	6/27/2017
Project Description	I-93 NB - from S. of Exit 4 to N of Exit 5		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	9
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b.->c	1500	4
3	Basic	Basic	c->d	4525	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	11825	4
6	Diverge	Diverge	f->g	1500	4
7	Basic	Basic	g->h	4100	4
8	Merge	Merge	h->i	1500	4
9	Basic	Basic	i->j	5280	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	6102	9600	0.64	68.8	22.2	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.92	0.979	0.991	6102	2583	9600	4200	0.64	0.62	63.7	57.0	23.9	12.5	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.979	3542	9600	0.37	70.0	12.7	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	

1	0.94	0.87	0.979	0.988	5613	2071	9600	2100	0.58	0.99	63.7	61.3	22.0	23.0	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5443	9600	0.57	69.7	19.5	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.67	0.985	0.964	5443	1014	9600	2100	0.57	0.48	66.9	60.9	20.3	25.3	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	4736	9600	0.49	70.0	16.9	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.985	0.988	6032	1296	9600	2100	0.63	0.62	63.5	60.9	23.7	24.1	C

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.985	5967	9600	0.62	69.0	21.6	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.6	19.6	19.2	6.1	C

Facility Overall Results

Space Mean Speed, mi/h	68.6	Density, veh/mi/ln	19.2
Average Travel Time, min	6.1		

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HCS 2010 Facilities Report

Project Information

Analyst	PK/LCG	Agency	
Jurisdiction		Time Period Analyzed	PM Peak - SB
Analysis Year	2040 Alternative F - PM	Date	6/18/2017
Project Description	I-93 SB - from N of Exit 5 to S of Exit 4		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	11
Total Time Periods	3	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	a->b	5280	4
2	Diverge	Diverge	b->c	1500	4
3	Basic	Basic	c->d	3920	4
4	Merge	Merge	d->e	1500	4
5	Basic	Basic	e->f	11730	4
6	Diverge	Diverge	f->g	1500	4
7	Basic	Basic	g->h	2550	4
8	Merge	Merge	h->i	1500	4
9	Basic	Basic	i->j	600	4
10	Merge	Merge	j->k	1500	4
11	Basic	Basic	l->m	5230	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.982	6099	9600	0.64	68.8	22.2	C
2	0.94	0.982	6099	9600	0.64	68.8	22.2	C
3	0.94	0.982	6099	9600	0.64	68.8	22.2	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.89	0.980	0.979	6099	1400	9600	2100	0.64	0.67	65.8	59.9	23.2	27.2	C
2	0.94	0.89	0.980	0.979	6099	1400	9600	2100	0.64	0.67	65.8	59.9	23.2	27.2	C
3	0.94	0.89	0.980	0.979	6099	1400	9600	2100	0.64	0.67	65.8	59.9	23.2	27.2	C

Segment 3: Basic

Time	PHF	fHV	Flow Rate	Capacity	d/c	Speed	Density	LOS

Period			(pc/h)	(pc/h)	Ratio	(mi/h)	(pc/mi/ln)	
1	0.94	0.982	4699	9600	0.50	70.0	16.8	B
2	0.94	0.982	4699	9600	0.50	70.0	16.8	B
3	0.94	0.982	4699	9600	0.50	70.0	16.8	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.81	0.982	0.978	5488	789	9600	2100	0.58	0.38	65.1	63.4	21.1	17.0	B
2	0.94	0.81	0.980	0.978	5488	789	9600	2100	0.58	0.38	65.1	63.4	21.1	17.0	B
3	0.94	0.81	0.980	0.978	5488	789	9600	2100	0.58	0.38	65.1	63.4	21.1	17.0	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.982	5488	9600	0.57	69.7	19.7	C
2	0.94	0.982	5488	9600	0.57	69.7	19.7	C
3	0.94	0.982	5488	9600	0.57	69.7	19.7	C

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.92	0.980	0.986	5488	2359	9600	2100	0.57	1.12	53.3	57.5	45.0	29.6	D
2	1.00	0.92	0.980	0.986	5488	2359	9600	2100	0.54	1.12	53.3	57.5	45.0	29.6	D
3	1.00	0.92	0.980	0.986	5488	2359	9600	2100	0.54	1.12	53.3	57.5	45.0	29.6	D

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3129	9600	0.33	70.0	11.2	B
2	0.94	0.980	3129	9600	0.33	70.0	11.2	B
3	0.94	0.980	3129	9600	0.33	70.0	11.2	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.90	0.82	0.978	0.980	3739	610	9600	2000	0.41	0.30	65.4	62.6	14.3	11.1	B
2	0.90	0.82	0.978	0.980	3739	610	9600	2000	0.41	0.30	65.4	62.6	14.3	11.1	B
3	0.90	0.82	0.978	0.980	3739	610	9600	2000	0.41	0.30	65.4	62.6	14.3	11.1	B

Segment 9: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	3739	9600	0.38	70.0	13.4	B
2	0.94	0.980	3739	9600	0.38	70.0	13.4	B

3	0.94	0.980	3739	9600	0.38	70.0	13.4	B

Segment 10: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.82	0.980	0.980	4567	828	9600	2100	0.47	0.39	65.7	63.8	17.4	14.5	B
2	0.94	0.82	0.980	0.980	4567	828	9600	2100	0.47	0.39	65.7	63.8	17.4	14.5	B
3	0.94	0.82	0.980	0.980	4567	828	9600	2100	0.47	0.39	65.7	63.8	17.4	14.5	B

Segment 11: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.980	4567	9600	0.46	70.0	16.3	B
2	0.94	0.980	4567	9600	0.46	70.0	16.3	B
3	0.94	0.980	4567	9600	0.46	70.0	16.3	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	68.4	19.5	19.1	6.1	C
2	68.4	19.5	19.1	6.1	C
3	68.4	19.5	19.1	6.1	C

Facility Overall Results

Space Mean Speed, mi/h	68.4	Density, veh/mi/ln	19.1
Average Travel Time, min	6.1		

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APPENDIX M: ESTIMATE OF CONTRIBUTION OF WOODMONT COMMONS TRAFFIC TO EXITS 4 AND 4A

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TO: File

FROM: Paul Konieczka, AICP PK
Linda C. Greer, PE, PTOE LCG

DATE: February 5, 2018

RE: Traffic Technical Memo
Estimate of Contribution of Woodmont Commons Traffic to Exits 4 and 4A
CLD | Fuss & O'Neill Reference No. 05-0244

The Freeway Facilities analysis for the Exit 4A project showed a few cases, such as the Exit 4A SB off-ramp under Alternative A, where a single lane on- or off-ramp would not provide an acceptable operating condition, or Level of Service (LOS). Ameliorating this condition would require either a two-lane ramp or a reduction in volume that would improve the LOS. The NHDOT requested that the project team investigate the potential contribution of traffic from the proposed Woodmont Commons development to the various Exit 4 and Exit 4A ramps for the various interchange alternatives under consideration. This information should provide some guidance as to the sensitivity of these analyses to the assumed development scenarios for Woodmont Commons, especially since the full traffic impact of that development project has been assigned to the Exit 4A modeling network without any consideration for the 23% of potential internally captured trips estimated in the Woodmont Commons master transportation study. This approach was agreed upon between CLD | Fuss and O'Neill and the NHDOT per an email dated March 8, 2017.

It should be restated that the 2040 land use scenarios for the Woodmont Commons development vary by alternative. The southerly interchange alternatives (A and B) assume the maximum potential development scenario as allowed by the proposed zoning and the conditional use permit issued by the Town of Londonderry. The No-Build case as well as the remaining Build alternatives, either with or without an interchange (C, D and F), have assumed a less intense development scenario for the Woodmont Commons project.

To develop these traffic estimates, we worked with the Southern New Hampshire Planning Commission (SNHPC) to provide information on the allocation of trips to the various Exit 4 and 4A ramps from the various traffic zones in their network, including the Woodmont Commons traffic zones (Zone 277 on the west side of I-93 and Zones 69 and 375 on the east side), from the regional travel demand model that was used for this project. We requested this information for the 2015 base year to set a pre-Woodmont development condition as well as the 2040 design year for the No-Build alternative and two of the five 4A Build alternative interchange/connector road configurations (Alternative A with a southerly interchange, and Alternative C with a northerly interchange). This model only provides Average Weekday Traffic volumes (AWDTs) so a percentage of the projected daily traffic assignments attributable to these three zones could be calculated. Color plots of the trip assignments to the existing and proposed ramps were provided by

SNHPC for all the ramps and scenarios requested, which are attached to this memo. This information was also summarized in tabular form, which is also attached to this memo.

Findings

The data shows that the 2015 development of the three subject zones has only a small contribution to the Exit 4 ramps, mostly from the Zone 277 area (Garden Lane), and totals only about 12.7% of daily traffic on all Exit 4 ramps. The two zones to the east have minimal existing development and contribute few trips to Exit 4.

By the 2040 No-Build case, assumed the lesser Woodmont Commons development scenario, traffic from the three zones contribute almost 27% of total daily ramp traffic at Exit 4. The total number of trips assigned to the ramps by the model would more than double by 2040, and the contribution of Woodmont traffic from the three zones to each individual ramp would increase by approximately a factor of 2 over 2015 conditions. Woodmont-related trips would account for almost 40% of the total increase in ramp traffic at Exit 4 in the 2040 No-Build case. Except for the SB on-ramp from the east, Woodmont traffic accounts for between 24-44% of the traffic assigned to any one ramp on a daily basis.

With Alternative A in place, total ramp assignments at Exit 4 are reduced by about 20% to 62,773 trips per day. However, because that the Woodmont development scenario is maximized with a southerly interchange in place, the traffic assignments from the three Woodmont zones make up a larger proportion of total ramp traffic at Exit 4, to about 36% of the total, even with Exit 4A in place. The NB on-ramp and SB off-ramp see increases in traffic over the No-Build case with Alternative A in place, while the SB on-ramp traffic sees modest reductions. The NB off-ramp sees a small increase in traffic with Alternative A over the 2040 No-Build case.

At Exit 4A, Woodmont-related traffic assignments account for roughly the same percentage of total ramp traffic (36.3%) as they do at Exit 4 (36.2%). Woodmont-related traffic contributions range from between 26% (4,887 of the 18,996 total daily trips assigned to the SB Off-ramp) to 55% (4,795 of the 8,732 total daily trips assigned to the NB off-ramp) of total traffic on any one ramp at Exit 4A. The sensitivity analysis of the operations of the Exit 4A SB off-ramp as a single-lane off-ramp, as presented in the Traffic Technical Report, indicated that a reduction of 200 AM peak hour trips at this ramp would allow it to operate below capacity under 2040 conditions, so if the Woodmont development does not generate as much external traffic as projected in the SDEIS, this ramp may function acceptably as a single-lane off-ramp.

With a northerly interchange and a new roadway in Derry, as provided in Alternative C, the potential impacts of Woodmont-related traffic assignments on Exit 4A ramp volumes are much less in 2040 as compared to Alternative A. For one thing, the Woodmont development scenario is similar to the No-Build case, so it is not as intense as with a southerly interchange (Alternatives A or B). Furthermore, the interchange is further north of Exit 4, and not directly proximate to the Woodmont development itself, so its attractiveness as an alternate route from I-93 is diminished. As the table shows, Woodmont-related traffic comprises only 1% of total ramp traffic or individual ramp traffic at a northerly interchange. At Exit 4, there is slightly less total ramp traffic than under Alternative A, and Woodmont-related traffic accounts for just under a third of the total. The Exit 4

NB on-ramp and SB off-ramp see the greatest increases in traffic assignments with Alternative C in place, as compared to the 2040 No-Build condition, but not to the same degree as with Alternative A in place.

Summary

In summary, based on the SNHPC traffic model, the different development scenarios for the Woodmont Commons project have varying effects on projected 2040 traffic assignments at both Exits 4 and 4A, depending on the location of the interchange. In the 2040 No-Build case, Woodmont traffic is projected to comprise about 27% of total daily ramp traffic at Exit 4, but will be a larger share (36%) of Exit 4 traffic with Alternative A and the maximum projected development scenario that was assumed for this case. Woodmont-related traffic will also account for more than a third of ramp traffic at Exit 4A with Alternative A, but substantially less with a northerly interchange (Alternative C).

It should be stressed that these are raw model assignments only to provide a broad-brush, order of magnitude level of impact on ramp traffic without any consideration of possible 'internally captured trips' within the mixed-use development itself that may not be assigned to the local street network per the 'live, work, play' design intent of the Woodmont project. Consideration of a 'credit' for any internally captured trips would also not directly translate into a similar reduction in any particular ramp volume (i.e., using a 10% capture rate does not necessarily mean that all ramps would see a 10% reduction in volumes) since the characteristics of the 'captured' trips may be different. The NHDOT and the developer are and will continue to coordinate efforts to monitor traffic conditions and the need for any additional improvements as the Woodmont project progresses and actual traffic volumes are realized.

PK:LCG:ams

Attachments
- Table – Contribution of Woodmont Commons Traffic Zones to Exit 4 and 4A Ramp Volumes
- SNHPC Traffic Assignments – Selected Links at Exit 4 and 4A Interchange Ramps – 2015 Base Case, 2040 No-Build, 2040 Alternative A, and 2040 Alternative C

CONTRIBUTION OF WOODMONT COMMONS TRAFFIC ZONES TO EXIT 4 AND 4A RAMP VOLUMES

2/1/2018

Scenario:
2015 No-Build

Ramp	Total Trips Assigned	Woodmont zones 277	69	375	WC sum	% ramp total
Exit 4						
NB Off-ramp	10,389	1,053	10	-	1,063	10.2%
NB On-ramp	9,550	1,171	3	-	1,174	12.3%
SB On-ramp fr/ East	3,637	-	10	-	10	0.3%
SB On-ramp fr. West	4,907	1,087	-	-	1,087	22.2%
SB Off-ramp	8,157	1,306	-	-	1,306	16.0%
Total	36,640				4,640	12.7%

Scenario:
2040 No-Build

Ramp	Total Trips Assigned	Woodmont zones 277	69	375	WC sum	% ramp total	Diff from 2015 NoBd
Exit 4							
NB Off-ramp	20,215	4,670	163	98	4,931	24.4%	14.2%
NB On-ramp	21,343	5,292	150	90	5,532	25.9%	13.6%
SB On-ramp fr/ East	7,402	-	151	94	245	3.3%	3.0%
SB On-ramp fr. West	10,778	4,724	-	-	4,724	43.8%	21.7%
SB Off-ramp	18,349	5,375	140	57	5,572	30.4%	14.4%
Total	78,087				21,004	26.9%	14.2%

Scenario:
2040 Build - Alternative A

Ramp	Total Trips Assigned	Woodmont zones 277	69	375	WC sum	% ramp total	Diff from 2040 NoBd
Exit 4							
NB Off-ramp	18,073	5,062	-	-	5,062	28.0%	3.6%
NB On-ramp	15,150	5,823	485	325	6,633	43.8%	17.9%
SB On-ramp fr/ East	3,879	-	-	-	-	0.0%	-3.3%
SB On-ramp fr. West	11,836	5,093	-	-	5,093	43.0%	-0.8%
SB Off-ramp	13,795	5,919	-	-	5,919	42.9%	12.5%
Total	62,733				22,707	36.2%	9.3%

Scenario:
2040 Build - Alternative A

Ramp	Total Trips Assigned	Woodmont zones 277	69	375	WC sum	% ramp total
Exit 4A						
NB Off-ramp	8,732	-	2,833	1,962	4,795	54.9%
NB On-ramp	15,240	-	2,940	2,063	5,003	32.8%
SB Off-ramp	18,996	-	2,864	2,023	4,887	25.7%
SB On-ramp	10,752	-	2,831	1,996	4,827	44.9%
Total	53,720				19,512	36.3%

Scenario:
2040 Build - Alternative C

Ramp	Total Trips Assigned	Woodmont zones 277	69	375	WC sum	% ramp total	Diff from 2040 NoBd
Exit 4							
NB Off-ramp	18,728	4,589	163	95	4,847	25.9%	1.5%
NB On-ramp	15,903	5,309	146	-	5,455	34.3%	8.4%
SB On-ramp fr/ East	5,140	-	152	92	244	4.7%	1.4%
SB On-ramp fr. West	10,850	4,618	-	-	4,618	42.6%	-1.3%
SB Off-ramp	12,694	5,347	-	-	5,347	42.1%	11.8%
Total	63,315				20,511	32.4%	5.5%

Scenario:
2040 Build - Alternative C

Ramp	Total Trips Assigned	Woodmont zones 277	69	375	WC sum	% ramp total
Exit 4A						
NB Off-ramp	2,795	23	-	-	23	0.8%
NB On-ramp	13,410	-	-	89	89	0.7%
SB Off-ramp	17,920	-	132	113	245	1.4%
SB On-ramp	5,021	43	-	-	43	0.9%
Total	39,146				400	1.0%

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2015 Exit 4 SB Off Ramp

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2015 Exit 4 NB Off Ramp

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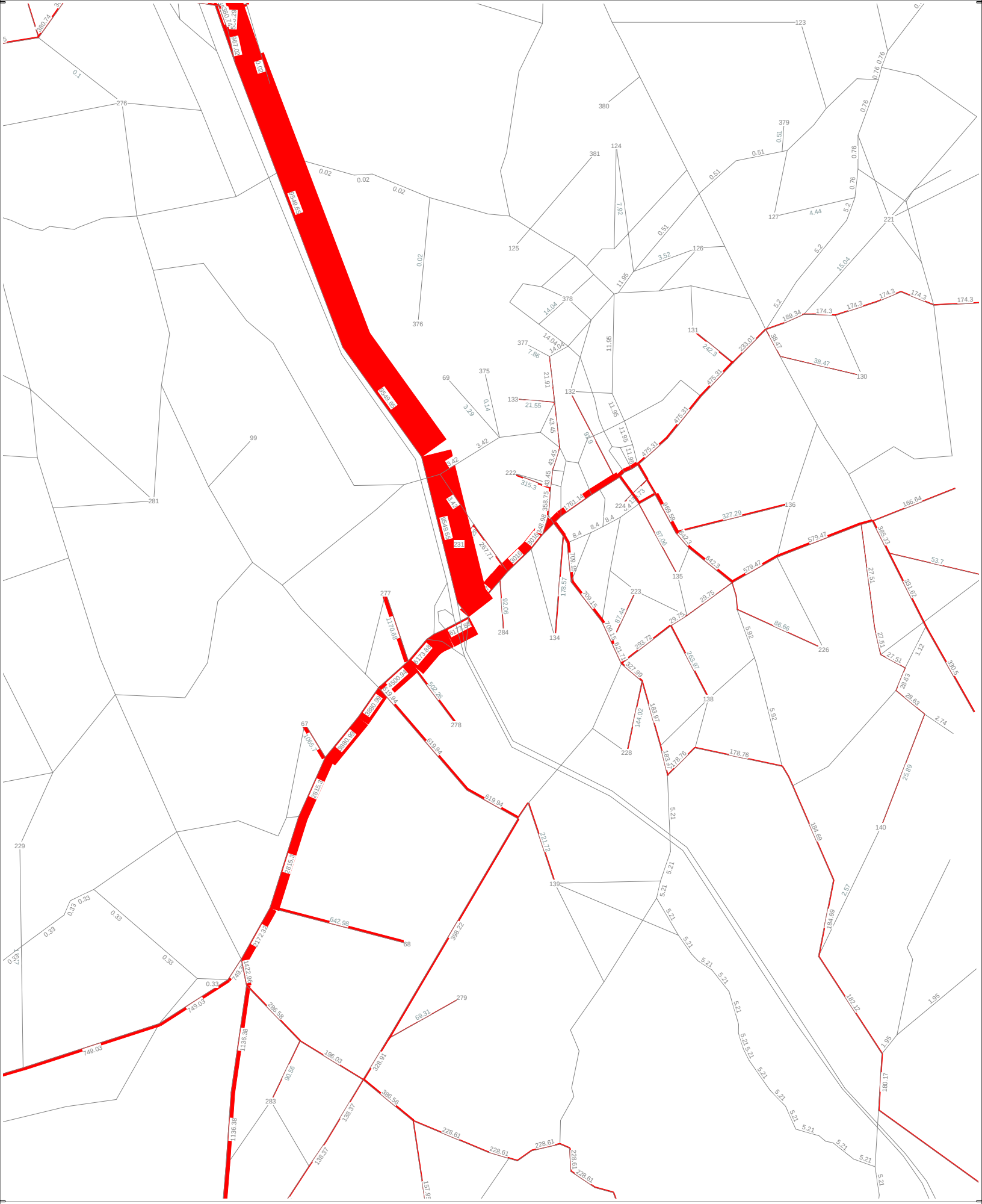

2015 Exit 4 NB On Ramp

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2015 Exit 4 SB On Ramp From East

(Licensed to Southern New Hampshire Planning Commission)

2015NB Exit 4 SB on Ramp from East
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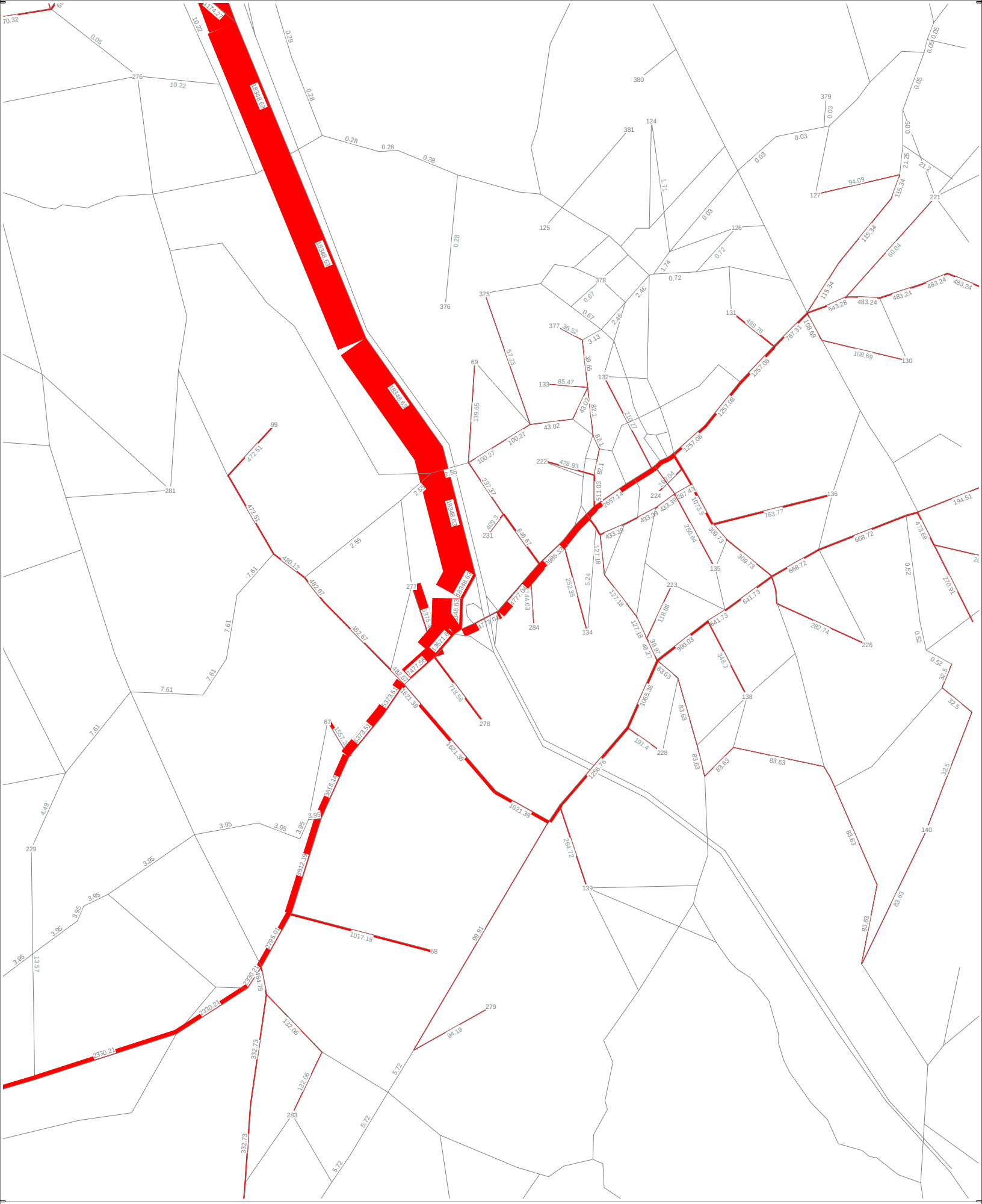

2040NB Exit 4 SB off Ramp

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2040NB Exit 4 NB off Ramp

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2040NB Exit 4 NB on Ramp

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2040 Alt A Exit 4A NB off Ramp

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18995.91

2040 Alt A Exit 4A SB on Ramp

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2040 Alt A Exit 4 NB Off Ramp

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2040 Alt A Exit 4 NB On Ramp
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(Licensed to Southern New Hampshire Planning Commission)

2040 Alt A Exit 4 SB On Ramp from East

cube

(Licensed to Southern New Hampshire Planning Commission)

2040 Alt A Exit 4 SB On Ramp from West

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(Licensed to Southern New Hampshire Planning Commission)

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2040 Alt C Exit 4 NB on Ramp

cube

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283
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2040 Alt C Exit 4 SB on Ramp from West

cube

(Licensed to Southern New Hampshire Planning Commission)

2040 Alt C Exit 4 SB off Ramp

cube

(Licensed to Southern New Hampshire Planning Commission)

2040 Alt C Exit 4A off Ramp

cube

(Licensed to Southern New Hampshire Planning Commission)

2040 Alt C Exit 4A NB on Ramp

cube

(Licensed to Southern New Hampshire Planning Commission)

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1358.45
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88.86
379
1034.68
381
124
1576.33
340.07
199.82
199.82
199.82
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5021.42
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944
816.6
944.68
1531.08
1531.08
1531.08
125
376.05
163.42
376
126
386.45
127
221
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2040 Alt C Exit 4 NB off Ramp

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APPENDIX N-1: 2040 NO-BUILD INTERSECTION CAPACITY ANALYSES – HCS PRINTOUTS – AM PEAK HOUR

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1260	1320	0	925	1175
Future Volume (vph)	0	1260	1320	0	925	1175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		0.95	0.95		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3406		1930	2682
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3406		1930	2682
Peak-hour factor, PHF	0.93	0.93	0.88	0.88	0.89	0.89
Adj. Flow (vph)	0	1355	1500	0	1039	1320
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1355	1500	0	1039	1320
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		21.0	21.0		27.0	27.0
Effective Green, g (s)		21.0	21.0		27.0	27.0
Actuated g/C Ratio		0.35	0.35		0.45	0.45
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1214	1192		868	1206
v/s Ratio Prot		0.39	c0.44		c0.54	0.49
v/s Ratio Perm						
v/c Ratio		1.12	1.26		1.20	1.09
Uniform Delay, d1		19.5	19.5		16.5	16.5
Progression Factor		1.44	1.52		1.00	1.00
Incremental Delay, d2		59.3	116.9		99.8	55.7
Delay (s)		87.4	146.7		116.3	72.2
Level of Service		F	F		F	E
Approach Delay (s)		87.4	146.7		91.7	
Approach LOS		F	F		F	

Intersection Summary			
HCM 2000 Control Delay	106.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	99.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	1265	0	1070	0	0	1000	1185	0	0	540	780
Future Volume (vph)	1265	0	1070	0	0	1000	1185	0	0	540	780
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0	6.0			6.0	4.0
Lane Util. Factor	0.97		0.88			0.97	0.95			0.95	1.00
Frt	1.00		0.85			1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)	3242		2632			3335	3438			3505	1568
Flt Permitted	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (perm)	3242		2632			3335	3438			3505	1568
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	1438	0	1216	0	0	1064	1261	0	0	587	848
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1438	0	1216	0	0	1064	1261	0	0	587	848
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Actuated Green, G (s)	44.0		44.0			32.0	64.0			26.0	120.0
Effective Green, g (s)	44.0		44.0			32.0	64.0			26.0	120.0
Actuated g/C Ratio	0.37		0.37			0.27	0.53			0.22	1.00
Clearance Time (s)	6.0		6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	1188		965			889	1833			759	1568
v/s Ratio Prot	0.44		c0.46			c0.32	0.37			c0.17	
v/s Ratio Perm											0.54
v/c Ratio	1.21		1.26			1.20	0.69			0.77	0.54
Uniform Delay, d1	38.0		38.0			44.0	20.6			44.2	0.0
Progression Factor	1.00		1.00			0.86	1.02			1.00	1.00
Incremental Delay, d2	102.7		125.5			89.7	0.2			7.5	1.3
Delay (s)	140.7		163.5			127.6	21.2			51.8	1.3
Level of Service	F		F			F	C			D	A
Approach Delay (s)		151.2		0.0			69.9			22.0	
Approach LOS		F		A			E			C	

Intersection Summary			
HCM 2000 Control Delay	92.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	935	390	240	550	0	0	0	0	820	0	535
Future Volume (vph)	0	935	390	240	550	0	0	0	0	820	0	535
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3471	1553	1719	3438					3367		1553
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3471	1553	1719	3438					3367		1553
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	0	1075	448	279	640	0	0	0	0	901	0	588
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	189
Lane Group Flow (vph)	0	1075	448	279	640	0	0	0	0	901	0	399
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Actuated Green, G (s)		35.3	100.0	17.7	59.0					29.0		29.0
Effective Green, g (s)		35.3	100.0	17.7	59.0					29.0		29.0
Actuated g/C Ratio		0.35	1.00	0.18	0.59					0.29		0.29
Clearance Time (s)		6.0		6.0	6.0					6.0		6.0
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Lane Grp Cap (vph)		1225	1553	304	2028					976		450
v/s Ratio Prot		c0.31		c0.16	0.19					c0.27		0.26
v/s Ratio Perm			0.29									
v/c Ratio		0.88	0.29	0.92	0.32					0.92		0.89
Uniform Delay, d1		30.3	0.0	40.4	10.3					34.4		33.9
Progression Factor		1.00	1.00	0.12	0.00					1.00		1.00
Incremental Delay, d2		9.0	0.5	16.0	0.2					13.8		18.6
Delay (s)		39.4	0.5	20.7	0.2					48.2		52.5
Level of Service		D	A	C	A					D		D
Approach Delay (s)		27.9			6.4			0.0			49.9	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	605	1150	0	0	495	545	295	0	375	0	0	0
Future Volume (vph)	605	1150	0	0	495	545	295	0	375	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1752	3505			3505	1568	1703		1524			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1752	3505			3505	1568	1703		1524			
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.67	0.67	0.67	0.92	0.92	0.92
Adj. Flow (vph)	658	1250	0	0	544	599	440	0	560	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	69	0	0	0
Lane Group Flow (vph)	658	1250	0	0	544	599	440	0	491	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	6%	6%	6%	2%	2%	2%
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Actuated Green, G (s)	35.0	58.0			17.0	100.0	30.0		30.0			
Effective Green, g (s)	35.0	58.0			17.0	100.0	30.0		30.0			
Actuated g/C Ratio	0.35	0.58			0.17	1.00	0.30		0.30			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Lane Grp Cap (vph)	613	2032			595	1568	510		457			
v/s Ratio Prot	c0.38	0.36			c0.16		0.26		c0.32			
v/s Ratio Perm						0.38						
v/c Ratio	1.07	0.62			0.91	0.38	0.86		1.08			
Uniform Delay, d1	32.5	13.7			40.8	0.0	33.1		35.0			
Progression Factor	0.20	0.41			1.00	1.00	1.00		1.00			
Incremental Delay, d2	46.9	0.6			20.9	0.7	14.0		63.8			
Delay (s)	53.5	6.1			61.7	0.7	47.1		98.8			
Level of Service	D	A			E	A	D		F			
Approach Delay (s)		22.5			29.7			76.0			0.0	
Approach LOS		C			C			E			A	

Intersection Summary			
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	5	0	295	0	0	0	955	1260	0	5	1160	10
Future Volume (vph)	5	0	295	0	0	0	955	1260	0	5	1160	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0				6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00				1.00	0.95		1.00	0.95	
Frt		1.00	0.85				1.00	1.00		1.00	1.00	
Flt Protected		0.95	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1770	1583				1770	3539		1770	3535	
Flt Permitted		1.00	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1863	1583				1770	3539		1770	3535	
Peak-hour factor, PHF	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	0	321	0	0	0	1038	1370	0	5	1261	11
RTOR Reduction (vph)	0	0	207	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	5	114	0	0	0	1038	1370	0	5	1271	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	custom				Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Actuated Green, G (s)		1.3	35.1				44.1	78.3		0.9	35.1	
Effective Green, g (s)		1.3	35.1				44.1	78.3		0.9	35.1	
Actuated g/C Ratio		0.01	0.36				0.45	0.79		0.01	0.36	
Clearance Time (s)		6.0	6.0				6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0				3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		24	564				792	2813		16	1259	
v/s Ratio Prot							c0.59	0.39		0.00	c0.36	
v/s Ratio Perm		c0.00	0.07									
v/c Ratio		0.21	0.20				1.31	0.49		0.31	1.01	
Uniform Delay, d1		48.1	22.0				27.2	3.4		48.5	31.7	
Progression Factor		1.00	1.00				1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.3	0.2				148.8	0.1		10.9	27.8	
Delay (s)		52.4	22.2				176.0	3.5		59.4	59.5	
Level of Service		D	C				F	A		E	E	
Approach Delay (s)		22.6			0.0			77.9			59.5	
Approach LOS		C			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	67.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	98.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	108.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	5	30	0	230	0	50	0	860	215	5	555	0
Future Volume (vph)	5	30	0	230	0	50	0	860	215	5	555	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.98			0.97			1.00	
Flt Protected		0.99			0.96			1.00			1.00	
Satd. Flow (prot)		1850			1729			1712			1809	
Flt Permitted		0.96			0.72			1.00			0.75	
Satd. Flow (perm)		1782			1304			1712			1364	
Peak-hour factor, PHF	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	8	50	0	240	0	52	0	966	242	6	645	0
RTOR Reduction (vph)	0	0	0	0	29	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	58	0	0	263	0	0	1198	0	0	651	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Actuated Green, G (s)		18.0			18.0			60.4			60.4	
Effective Green, g (s)		18.0			18.0			60.4			60.4	
Actuated g/C Ratio		0.20			0.20			0.67			0.67	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		354			259			1143			911	
v/s Ratio Prot								c0.70				
v/s Ratio Perm		0.03			c0.20						0.48	
v/c Ratio		0.16			1.02			1.05			0.71	
Uniform Delay, d1		30.0			36.2			15.0			9.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			60.1			40.2			2.7	
Delay (s)		30.2			96.3			55.2			12.2	
Level of Service		C			F			E			B	
Approach Delay (s)		30.2			96.3			55.2			12.2	
Approach LOS		C			F			E			B	

Intersection Summary			
HCM 2000 Control Delay	47.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	90.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	105	180	35	135	180	160	100	470	60	70	335	65
Future Volume (vph)	105	180	35	135	180	160	100	470	60	70	335	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1800		1752	1845	1568	1787	1849		1787	1835	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1800		1752	1845	1568	1787	1849		1787	1835	
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95	0.94	0.94	0.94
Adj. Flow (vph)	115	198	38	145	194	172	105	495	63	74	356	69
RTOR Reduction (vph)	0	9	0	0	0	118	0	5	0	0	8	0
Lane Group Flow (vph)	115	227	0	145	194	54	105	553	0	74	417	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4	5	5	2		1	6	
Permitted Phases						4						
Actuated Green, G (s)	8.4	16.9		8.9	17.4	26.9	9.5	29.1		6.1	25.7	
Effective Green, g (s)	8.4	16.9		8.9	17.4	26.9	9.5	29.1		6.1	25.7	
Actuated g/C Ratio	0.10	0.20		0.10	0.20	0.32	0.11	0.34		0.07	0.30	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	173	357		183	377	606	199	633		128	554	
v/s Ratio Prot	0.07	c0.13		c0.08	0.11	0.01	c0.06	c0.30		0.04	0.23	
v/s Ratio Perm						0.02						
v/c Ratio	0.66	0.64		0.79	0.51	0.09	0.53	0.87		0.58	0.75	
Uniform Delay, d1	36.9	31.2		37.1	30.0	20.4	35.6	26.2		38.2	26.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.3	3.7		20.5	1.2	0.1	2.5	15.4		6.2	5.8	
Delay (s)	46.2	34.9		57.6	31.2	20.5	38.1	41.6		44.4	32.5	
Level of Service	D	C		E	C	C	D	D		D	C	
Approach Delay (s)		38.6			35.1			41.1			34.3	
Approach LOS		D			D			D			C	

Intersection Summary				
HCM 2000 Control Delay	37.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	24.0	
Intersection Capacity Utilization	86.2%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1145	0	0	195	170	455
Future Volume (vph)	1145	0	0	195	170	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.902	
Flt Protected	0.950					
Satd. Flow (prot)	1787	0	0	1863	1697	0
Flt Permitted	0.950					
Satd. Flow (perm)	1787	0	0	1863	1697	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	322			309	249	
Travel Time (s)	7.3			7.0	5.7	
Peak Hour Factor	0.90	0.90	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	1%	2%	2%	1%	1%
Adj. Flow (vph)	1272	0	0	224	195	523
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1272	0	0	224	718	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 111.3%		ICU Level of Service H	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1145	0	0	195	170	455
Future Volume (Veh/h)	1145	0	0	195	170	455
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	1272	0	0	224	195	523
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	680	456	718			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	680	456	718			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	100			
cM capacity (veh/h)	418	606	883			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	1272	224	718
Volume Left	1272	0	0
Volume Right	0	0	523
cSH	418	883	1700
Volume to Capacity	3.04	0.00	0.42
Queue Length 95th (ft)	Err	0	0
Control Delay (s)	Err	0.0	0.0
Lane LOS	F		
Approach Delay (s)	Err	0.0	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	5744.7		
Intersection Capacity Utilization	111.3%	ICU Level of Service	H
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	0	0	1173	625	5
Future Volume (vph)	5	0	0	1173	625	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.999	
Flt Protected	0.950					
Satd. Flow (prot)	1703	0	0	1881	1879	0
Flt Permitted	0.950					
Satd. Flow (perm)	1703	0	0	1881	1879	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	160			224	319	
Travel Time (s)	3.6			5.1	7.3	
Peak Hour Factor	0.50	0.50	0.93	0.93	0.86	0.86
Heavy Vehicles (%)	6%	6%	1%	1%	1%	1%
Adj. Flow (vph)	10	0	0	1261	727	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	0	0	1261	733	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 78.2%		ICU Level of Service D	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	0	0	1173	625	5
Future Volume (Veh/h)	5	0	0	1173	625	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.50	0.50	0.93	0.93	0.86	0.86
Hourly flow rate (vph)	10	0	0	1261	727	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1991	730	733			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1991	730	733			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	85	100	100			
cM capacity (veh/h)	65	416	876			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	10	1261	733
Volume Left	10	0	0
Volume Right	0	0	6
cSH	65	876	1700
Volume to Capacity	0.15	0.00	0.43
Queue Length 95th (ft)	13	0	0
Control Delay (s)	70.2	0.0	0.0
Lane LOS	F		
Approach Delay (s)	70.2	0.0	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	50	1145	5	0	480	0	0	10	155	5	10	25
Future Volume (vph)	50	1145	5	0	480	0	0	10	155	5	10	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	0		0	150		150
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999						0.873			0.916	
Flt Protected		0.998									0.994	
Satd. Flow (prot)	0	1876	0	0	1863	0	0	1659	0	0	1730	0
Flt Permitted		0.998									0.994	
Satd. Flow (perm)	0	1876	0	0	1863	0	0	1659	0	0	1730	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		327			240			246			251	
Travel Time (s)		7.4			5.5			5.6			5.7	
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.67	0.67	0.67	0.82	0.82	0.82
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	53	1218	5	0	545	0	0	15	231	6	12	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1276	0	0	545	0	0	246	0	0	48	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 106.4%		ICU Level of Service G	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	50	1145	5	0	480	0	0	10	155	5	10	25
Future Volume (Veh/h)	50	1145	5	0	480	0	0	10	155	5	10	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.67	0.67	0.67	0.82	0.82	0.82
Hourly flow rate (vph)	53	1218	5	0	545	0	0	15	231	6	12	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	545			1223			1908	1874	545	1879	1872	1220
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	545			1223			1908	1874	545	1879	1872	1220
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			100	78	57	76	83	86
cM capacity (veh/h)	1029			570			38	69	542	25	69	222

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total	1276	545	246	48
Volume Left	53	0	0	6
Volume Right	5	0	231	30
cSH	1029	570	382	88
Volume to Capacity	0.05	0.00	0.64	0.55
Queue Length 95th (ft)	4	0	108	61
Control Delay (s)	1.9	0.0	29.9	87.0
Lane LOS	A		D	F
Approach Delay (s)	1.9	0.0	29.9	87.0
Approach LOS			D	F

Intersection Summary				
Average Delay	6.6			
Intersection Capacity Utilization	106.4%	ICU Level of Service	G	
Analysis Period (min)	15			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	235	135	495	310	0	115	520	0	165	400	300
Future Volume (vph)	0	235	135	495	310	0	115	520	0	165	400	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	0.97	1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00		1.00	1.00		1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		3539	1583	3433	1863		1770	1863		1787	1881	1599
Flt Permitted		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		3539	1583	3433	1863		1770	1863		1787	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.96	0.96	0.96	0.95	0.95	0.95
Adj. Flow (vph)	0	255	147	527	330	0	120	542	0	174	421	316
RTOR Reduction (vph)	0	0	116	0	0	0	0	0	0	0	0	138
Lane Group Flow (vph)	0	255	31	527	330	0	120	542	0	174	421	178
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6		7	4		3	8	1
Permitted Phases			2			6			4			8
Actuated Green, G (s)		24.5	24.5	23.5	54.0		13.1	34.0		9.0	29.9	53.4
Effective Green, g (s)		24.5	24.5	23.5	54.0		13.1	34.0		9.0	29.9	53.4
Actuated g/C Ratio		0.21	0.21	0.20	0.47		0.11	0.30		0.08	0.26	0.46
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		753	337	701	874		201	550		139	489	825
v/s Ratio Prot		0.07		c0.15	c0.18		0.07	c0.29		c0.10	0.22	0.04
v/s Ratio Perm			0.02									0.07
v/c Ratio		0.34	0.09	0.75	0.38		0.60	0.99		1.25	0.86	0.22
Uniform Delay, d1		38.4	36.3	43.0	19.7		48.4	40.3		53.0	40.6	18.3
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		1.2	0.5	4.6	0.3		4.7	34.4		159.1	14.4	0.1
Delay (s)		39.6	36.9	47.6	19.9		53.1	74.6		212.1	54.9	18.5
Level of Service		D	D	D	B		D	E		F	D	B
Approach Delay (s)		38.6			36.9			70.7			72.3	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	56.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	60	110	785	370	95	775
Future Volume (vph)	60	110	785	370	95	775
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	150		0	0	
Storage Lanes	0	1		1	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.850		0.850		
Flt Protected	0.950					0.995
Satd. Flow (prot)	1787	1599	1881	1599	0	3556
Flt Permitted	0.950					0.995
Satd. Flow (perm)	1787	1599	1881	1599	0	3556
Link Speed (mph)	30		30			30
Link Distance (ft)	403		387			233
Travel Time (s)	9.2		8.8			5.3
Peak Hour Factor	0.86	0.86	0.96	0.96	0.85	0.85
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	70	128	818	385	112	912
Shared Lane Traffic (%)						
Lane Group Flow (vph)	70	128	818	385	0	1024
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 78.8%		ICU Level of Service D	
Analysis Period (min) 15			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (veh/h)	60	110	785	370	95	775
Future Volume (Veh/h)	60	110	785	370	95	775
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.96	0.96	0.85	0.85
Hourly flow rate (vph)	70	128	818	385	112	912
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type			None			None
Median storage veh)						
Upstream signal (ft)			387			
pX, platoon unblocked	0.74	0.74			0.74	
vC, conflicting volume	1498	818			818	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1497	581			581	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	3	62			85	
cM capacity (veh/h)	72	341			739	

Direction, Lane #	NW 1	NE 1	NE 2	SW 1	SW 2
Volume Total	198	818	385	416	608
Volume Left	70	0	0	112	0
Volume Right	128	0	385	0	0
cSH	204	1700	1700	739	1700
Volume to Capacity	0.97	0.48	0.23	0.15	0.36
Queue Length 95th (ft)	207	0	0	13	0
Control Delay (s)	83.7	0.0	0.0	4.3	0.0
Lane LOS	F			A	
Approach Delay (s)	83.7	0.0		1.8	
Approach LOS	F				

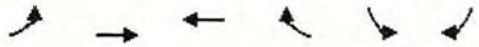
Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	150	1050	0	0	605	80	0	0	0	25	0	350
Future Volume (vph)	150	1050	0	0	605	80	0	0	0	25	0	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0						6.0	6.0
Lane Util. Factor	1.00	0.95			0.95						1.00	1.00
Frt	1.00	1.00			0.98						1.00	0.85
Flt Protected	0.95	1.00			1.00						0.95	1.00
Satd. Flow (prot)	1787	3574			3512						1787	1599
Flt Permitted	0.95	1.00			1.00						0.76	1.00
Satd. Flow (perm)	1787	3574			3512						1424	1599
Peak-hour factor, PHF	0.97	0.97	0.97	0.95	0.95	0.95	0.90	0.90	0.90	0.80	0.80	0.80
Adj. Flow (vph)	155	1082	0	0	637	84	0	0	0	31	0	438
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	0	353
Lane Group Flow (vph)	155	1082	0	0	713	0	0	0	0	0	31	85
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA				Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4	4	4
Actuated Green, G (s)	13.5	72.6			53.1						10.4	10.4
Effective Green, g (s)	13.5	72.6			53.1						10.4	10.4
Actuated g/C Ratio	0.14	0.76			0.56						0.11	0.11
Clearance Time (s)	6.0	6.0			6.0						6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0						3.0	3.0
Lane Grp Cap (vph)	253	2731			1963						155	175
v/s Ratio Prot	c0.09	c0.30			0.20							
v/s Ratio Perm											0.02	c0.05
v/c Ratio	0.61	0.40			0.36						0.20	0.49
Uniform Delay, d1	38.3	3.8			11.6						38.5	39.8
Progression Factor	0.84	1.80			1.00						1.00	1.00
Incremental Delay, d2	3.7	0.4			0.5						0.6	2.1
Delay (s)	35.9	7.2			12.1						39.2	41.9
Level of Service	D	A			B						D	D
Approach Delay (s)		10.8			12.1			0.0			41.7	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	815	5	5	530	255	35	10	10	350	5	135
Future Volume (vph)	115	815	5	5	530	255	35	10	10	350	5	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00		1.00	0.95		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	3467	3571		1770	3367		1805	1758		1715	1721	1615
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.95	1.00
Satd. Flow (perm)	3467	3571		1770	3367		1805	1758		1715	1721	1615
Peak-hour factor, PHF	0.84	0.84	0.84	0.90	0.90	0.90	0.78	0.78	0.78	0.86	0.86	0.86
Adj. Flow (vph)	137	970	6	6	589	283	45	13	13	407	6	157
RTOR Reduction (vph)	0	0	0	0	59	0	0	12	0	0	0	112
Lane Group Flow (vph)	137	976	0	6	813	0	45	14	0	208	205	45
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases		2			6							
Actuated Green, G (s)	7.7	52.4		1.0	45.7		4.0	4.0		13.6	13.6	27.3
Effective Green, g (s)	7.7	52.4		1.0	45.7		4.0	4.0		13.6	13.6	27.3
Actuated g/C Ratio	0.08	0.55		0.01	0.48		0.04	0.04		0.14	0.14	0.29
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	281	1969		18	1619		76	74		245	246	464
v/s Ratio Prot	c0.04	c0.27		0.00	0.24		c0.02	0.01		c0.12	0.12	0.03
v/s Ratio Perm												
v/c Ratio	0.49	0.50		0.33	0.50		0.59	0.18		0.85	0.83	0.10
Uniform Delay, d1	41.8	13.1		46.7	16.9		44.7	43.9		39.7	39.6	24.8
Progression Factor	1.00	1.00		1.38	0.82		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.3	0.9		9.2	0.2		11.8	1.2		23.0	20.8	0.1
Delay (s)	43.1	14.0		73.8	14.1		56.5	45.1		62.7	60.4	24.9
Level of Service	D	B		E	B		E	D		E	E	C
Approach Delay (s)		17.6			14.5			52.3			51.5	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	24.0	
Intersection Capacity Utilization	58.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	40	630	515	20	40	90
Future Volume (vph)	40	630	515	20	40	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.995		0.906	
Flt Protected	0.950				0.985	
Satd. Flow (prot)	1770	1863	1853	0	1646	0
Flt Permitted	0.950				0.985	
Satd. Flow (perm)	1770	1863	1853	0	1646	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		535	210		522	
Travel Time (s)		12.2	4.8		11.9	
Peak Hour Factor	0.91	0.91	0.90	0.90	0.75	0.75
Heavy Vehicles (%)	2%	2%	2%	2%	3%	3%
Adj. Flow (vph)	44	692	572	22	53	120
Shared Lane Traffic (%)						
Lane Group Flow (vph)	44	692	594	0	173	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.7%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	630	515	20	40	90
Future Volume (Veh/h)	40	630	515	20	40	90
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.90	0.90	0.75	0.75
Hourly flow rate (vph)	44	692	572	22	53	120
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	594				1363	583
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	594				1363	583
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				66	76
cM capacity (veh/h)	982				155	510

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	44	692	594	173
Volume Left	44	0	0	53
Volume Right	0	0	22	120
cSH	982	1700	1700	300
Volume to Capacity	0.04	0.41	0.35	0.58
Queue Length 95th (ft)	4	0	0	84
Control Delay (s)	8.8	0.0	0.0	32.2
Lane LOS	A			D
Approach Delay (s)	0.5		0.0	32.2
Approach LOS				D

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	NBR2	SBL	SBT	SBR	NET	NER
Lane Configurations												
Traffic Volume (vph)	10	365	195	10	95	75	10	300	135	50	240	420
Future Volume (vph)	10	365	195	10	95	75	10	300	135	50	240	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.954			0.940				0.986		0.908	
Flt Protected		0.968			0.997				0.970			
Satd. Flow (prot)	0	1737	0	0	1746	0	0	0	1799	0	1708	0
Flt Permitted		0.968			0.997				0.970			
Satd. Flow (perm)	0	1737	0	0	1746	0	0	0	1799	0	1708	0
Link Speed (mph)		30			30				30		30	
Link Distance (ft)		449			456				370		390	
Travel Time (s)		10.2			10.4				8.4		8.9	
Peak Hour Factor	0.91	0.91	0.91	0.87	0.87	0.87	0.87	0.92	0.92	0.92	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	1%	1%	1%	1%	1%
Adj. Flow (vph)	11	401	214	11	109	86	11	326	147	54	267	467
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	626	0	0	217	0	0	0	527	0	834	0
Sign Control		Yield			Yield				Yield		Yield	

Intersection Summary			
Area Type:	Other		
Control Type: Roundabout			
Intersection Capacity Utilization 127.5%		ICU Level of Service H	
Analysis Period (min) 15			

Lane Group	NER2	SWL	SWT
Lane Configurations			
Traffic Volume (vph)	90	35	130
Future Volume (vph)	90	35	130
Ideal Flow (vphpl)	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00
Frt			
Flt Protected			0.990
Satd. Flow (prot)	0	0	1844
Flt Permitted			0.990
Satd. Flow (perm)	0	0	1844
Link Speed (mph)			30
Link Distance (ft)			523
Travel Time (s)			11.9
Peak Hour Factor	0.90	0.91	0.91
Heavy Vehicles (%)	1%	2%	2%
Adj. Flow (vph)	100	38	143
Shared Lane Traffic (%)			
Lane Group Flow (vph)	0	0	181
Sign Control			Yield

Movement	WBL2	WBL	WBR	NBL	NBT	NBR	NBR2	SBL	SBT	SBR	NET	NER
Right Turn Channelized												
Traffic Volume (veh/h)	10	365	195	10	95	75	10	300	135	50	240	420
Future Volume (veh/h)	10	365	195	10	95	75	10	300	135	50	240	420
Peak Hour Factor	0.91	0.91	0.91	0.87	0.87	0.87	0.87	0.92	0.92	0.92	0.90	0.90
Hourly flow rate (vph)	11	401	214	11	109	86	11	326	147	54	267	467
Approach Volume (veh/h)		626			217				527		834	
Crossing Volume (veh/h)		473			1060				604		522	
High Capacity (veh/h)		954			593				859		917	
High v/c (veh/h)		0.66			0.37				0.61		0.91	
Low Capacity (veh/h)		773			457				688		740	
Low v/c (veh/h)		0.81			0.47				0.77		1.13	

Intersection Summary				
Maximum v/c High	0.91			
Maximum v/c Low	1.13			
Intersection Capacity Utilization	127.5%	ICU Level of Service	H	

Movement	NER2	SWL	SWT
Right Turn Channelized			
Traffic Volume (veh/h)	90	35	130
Future Volume (veh/h)	90	35	130
Peak Hour Factor	0.90	0.91	0.91
Hourly flow rate (vph)	100	38	143
Approach Volume (veh/h)			181
Crossing Volume (veh/h)			746
High Capacity (veh/h)			766
High v/c (veh/h)			0.24
Low Capacity (veh/h)			607
Low v/c (veh/h)			0.30

Intersection Summary

Intersection	
Intersection Delay, s/veh	74.4
Intersection LOS	F

Approach	WB	NB	SB	NE
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	626	217	527	834
Demand Flow Rate, veh/h	632	221	532	843
Vehicles Circulating, veh/h	480	1071	612	527
Vehicles Exiting, veh/h	812	299	327	617
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	38.9	24.2	37.2	151.2
Approach LOS	E	C	E	F

Lane	Left	Left	Left	Left
Designated Moves	LR	LTR	LTR	LTR
Assumed Moves	LR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	632	221	532	843
Cap Entry Lane, veh/h	699	387	613	667
Entry HV Adj Factor	0.990	0.981	0.990	0.990
Flow Entry, veh/h	626	217	527	834
Cap Entry, veh/h	692	380	606	660
V/C Ratio	0.904	0.571	0.868	1.264
Control Delay, s/veh	38.9	24.2	37.2	151.2
LOS	E	C	E	F
95th %tile Queue, veh	12	3	10	32

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Approach	SW
Entry Lanes	1
Conflicting Circle Lanes	1
Adj Approach Flow, veh/h	181
Demand Flow Rate, veh/h	185
Vehicles Circulating, veh/h	754
Vehicles Exiting, veh/h	358
Follow-Up Headway, s	3.186
Ped Vol Crossing Leg, #/h	0
Ped Cap Adj	1.000
Approach Delay, s/veh	12.3
Approach LOS	B

Lane	Left
Designated Moves	LTR
Assumed Moves	LTR
RT Channelized	
Lane Util	1.000
Critical Headway, s	5.193
Entry Flow, veh/h	185
Cap Entry Lane, veh/h	532
Entry HV Adj Factor	0.979
Flow Entry, veh/h	181
Cap Entry, veh/h	521
V/C Ratio	0.348
Control Delay, s/veh	12.3
LOS	B
95th %tile Queue, veh	2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	350	0	0	0	120	150	0	0	130	10
Future Volume (vph)	5	0	350	0	0	0	120	150	0	0	130	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850								0.990	
Flt Protected		0.950						0.978				
Satd. Flow (prot)	0	1770	1583	0	1900	0	0	1840	0	0	1862	0
Flt Permitted		0.950						0.978				
Satd. Flow (perm)	0	1770	1583	0	1900	0	0	1840	0	0	1862	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		113			453			475			436	
Travel Time (s)		2.6			10.3			10.8			9.9	
Peak Hour Factor	0.88	0.88	0.88	0.82	0.82	0.82	0.93	0.93	0.93	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	6	0	398	0	0	0	129	161	0	0	143	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	398	0	0	0	0	290	0	0	154	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.8%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	350	0	0	0	120	150	0	0	130	10
Future Volume (Veh/h)	5	0	350	0	0	0	120	150	0	0	130	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.82	0.82	0.82	0.93	0.93	0.93	0.91	0.91	0.91
Hourly flow rate (vph)	6	0	398	0	0	0	129	161	0	0	143	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	568	568	148	966	573	161	154			161		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	568	568	148	966	573	161	154			161		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	56	100	100	100	91			100		
cM capacity (veh/h)	404	394	898	122	393	889	1433			1424		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	6	398	0	290	154
Volume Left	6	0	0	129	0
Volume Right	0	398	0	0	11
cSH	404	898	1700	1433	1424
Volume to Capacity	0.01	0.44	0.00	0.09	0.00
Queue Length 95th (ft)	1	58	0	7	0
Control Delay (s)	14.0	12.2	0.0	3.9	0.0
Lane LOS	B	B	A	A	
Approach Delay (s)	12.2		0.0	3.9	0.0
Approach LOS	B		A		

Intersection Summary				
Average Delay	7.1			
Intersection Capacity Utilization	35.8%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	100	80	25	55	50	195	195	800	75	25	265	40
Future Volume (vph)	100	80	25	55	50	195	195	800	75	25	265	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1797		1787	1881	1599	1805	1876		1805	1863	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1797		1787	1881	1599	1805	1876		1805	1863	
Peak-hour factor, PHF	0.99	0.99	0.99	0.95	0.95	0.95	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	101	81	25	58	53	205	219	899	84	27	285	43
RTOR Reduction (vph)	0	14	0	0	0	109	0	4	0	0	6	0
Lane Group Flow (vph)	101	92	0	58	53	96	219	979	0	27	322	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases		6			2							
Actuated Green, G (s)	7.1	17.6		4.8	15.3	35.5	14.2	30.4		3.2	19.4	
Effective Green, g (s)	7.1	17.6		4.8	15.3	35.5	14.2	30.4		3.2	19.4	
Actuated g/C Ratio	0.09	0.22		0.06	0.19	0.44	0.18	0.38		0.04	0.24	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	157	395		107	359	709	320	712		72	451	
v/s Ratio Prot	c0.06	c0.05		0.03	0.03	0.06	c0.12	c0.52		0.01	0.17	
v/s Ratio Perm												
v/c Ratio	0.64	0.23		0.54	0.15	0.14	0.68	1.38		0.38	0.71	
Uniform Delay, d1	35.2	25.6		36.5	26.9	13.2	30.8	24.8		37.4	27.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.7	0.3		5.5	0.9	0.1	5.9	177.7		3.3	5.3	
Delay (s)	43.9	26.0		42.0	27.8	13.3	36.7	202.5		40.7	33.1	
Level of Service	D	C		D	C	B	D	F		D	C	
Approach Delay (s)		34.7			21.0			172.3			33.6	
Approach LOS		C			C			F			C	

Intersection Summary			
HCM 2000 Control Delay	112.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	540	0	10	295	170	295
Future Volume (vph)	540	0	10	295	170	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.914	
Flt Protected	0.950			0.998		
Satd. Flow (prot)	1787	0	0	1859	1686	0
Flt Permitted	0.950			0.998		
Satd. Flow (perm)	1787	0	0	1859	1686	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	348			709	425	
Travel Time (s)	7.9			16.1	9.7	
Peak Hour Factor	0.90	0.90	0.87	0.87	0.89	0.89
Heavy Vehicles (%)	1%	1%	2%	2%	3%	3%
Adj. Flow (vph)	600	0	11	339	191	331
Shared Lane Traffic (%)						
Lane Group Flow (vph)	600	0	0	350	522	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.6%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	540	0	10	295	170	295
Future Volume (Veh/h)	540	0	10	295	170	295
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.87	0.87	0.89	0.89
Hourly flow rate (vph)	600	0	11	339	191	331
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	718	356	522			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	718	356	522			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	99			
cM capacity (veh/h)	393	690	1044			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	600	350	522
Volume Left	600	11	0
Volume Right	0	0	331
cSH	393	1044	1700
Volume to Capacity	1.53	0.01	0.31
Queue Length 95th (ft)	818	1	0
Control Delay (s)	274.7	0.4	0.0
Lane LOS	F	A	
Approach Delay (s)	274.7	0.4	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	112.1		
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

APPENDIX N-2: 2040 NO-BUILD INTERSECTION CAPACITY ANALYSES – HCS PRINTOUTS – PM PEAK HOUR

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1315	670	0	790	835
Future Volume (vph)	0	1315	670	0	790	835
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		0.95	0.95		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3406		1930	2682
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3406		1930	2682
Peak-hour factor, PHF	0.93	0.93	0.88	0.88	0.89	0.89
Adj. Flow (vph)	0	1414	761	0	888	938
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1414	761	0	888	938
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		23.0	23.0		25.0	25.0
Effective Green, g (s)		23.0	23.0		25.0	25.0
Actuated g/C Ratio		0.38	0.38		0.42	0.42
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1330	1305		804	1117
v/s Ratio Prot		c0.41	0.22		c0.46	0.35
v/s Ratio Perm						
v/c Ratio		1.06	0.58		1.10	0.84
Uniform Delay, d1		18.5	14.7		17.5	15.7
Progression Factor		1.03	0.90		1.00	1.00
Incremental Delay, d2		34.1	0.2		64.3	5.7
Delay (s)		53.2	13.4		81.8	21.4
Level of Service		D	B		F	C
Approach Delay (s)		53.2	13.4		50.8	
Approach LOS		D	B		D	

Intersection Summary			
HCM 2000 Control Delay	44.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	460	0	355	0	0	1190	915	0	0	1260	1125
Future Volume (vph)	460	0	355	0	0	1190	915	0	0	1260	1125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0	6.0			6.0	4.0
Lane Util. Factor	0.97		0.88			0.97	0.95			0.95	1.00
Frt	1.00		0.85			1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)	3242		2632			3335	3438			3505	1568
Flt Permitted	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (perm)	3242		2632			3335	3438			3505	1568
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	523	0	403	0	0	1266	973	0	0	1370	1223
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	523	0	403	0	0	1266	973	0	0	1370	1223
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Actuated Green, G (s)	17.0		17.0			41.0	91.0			44.0	120.0
Effective Green, g (s)	17.0		17.0			41.0	91.0			44.0	120.0
Actuated g/C Ratio	0.14		0.14			0.34	0.76			0.37	1.00
Clearance Time (s)	6.0		6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	459		372			1139	2607			1285	1568
v/s Ratio Prot	c0.16		0.15			c0.38	0.28			c0.39	
v/s Ratio Perm											0.78
v/c Ratio	1.14		1.08			1.11	0.37			1.07	0.78
Uniform Delay, d1	51.5		51.5			39.5	4.9			38.0	0.0
Progression Factor	1.00		1.00			0.86	1.15			1.00	1.00
Incremental Delay, d2	86.1		70.8			51.6	0.0			44.8	3.9
Delay (s)	137.6		122.3			85.6	5.7			82.8	3.9
Level of Service	F		F			F	A			F	A
Approach Delay (s)		130.9		0.0			50.9			45.6	
Approach LOS		F		A			D			D	

Intersection Summary			
HCM 2000 Control Delay	61.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	97.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	810	360	390	650	0	0	0	0	550	0	555
Future Volume (vph)	0	810	360	390	650	0	0	0	0	550	0	555
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3167	1417	1687	3374					3303		1524
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3167	1417	1687	3374					3303		1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.73	0.73	0.73	0.92	0.92	0.92	0.74	0.74	0.74
Adj. Flow (vph)	0	880	391	534	890	0	0	0	0	743	0	750
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	106
Lane Group Flow (vph)	0	880	391	534	890	0	0	0	0	743	0	644
Heavy Vehicles (%)	14%	14%	14%	7%	7%	7%	2%	2%	2%	6%	6%	6%
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Actuated Green, G (s)		40.0	140.0	38.0	84.0					44.0		44.0
Effective Green, g (s)		40.0	140.0	38.0	84.0					44.0		44.0
Actuated g/C Ratio		0.29	1.00	0.27	0.60					0.31		0.31
Clearance Time (s)		6.0		6.0	6.0					6.0		6.0
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Lane Grp Cap (vph)		904	1417	457	2024					1038		478
v/s Ratio Prot		c0.28		c0.32	0.26					0.22		c0.42
v/s Ratio Perm			0.28									
v/c Ratio		0.97	0.28	1.17	0.44					0.72		1.35
Uniform Delay, d1		49.5	0.0	51.0	15.2					42.5		48.0
Progression Factor		1.00	1.00	0.36	0.10					1.00		1.00
Incremental Delay, d2		24.2	0.5	92.9	0.3					2.4		169.5
Delay (s)		73.6	0.5	111.5	1.8					44.8		217.5
Level of Service		E	A	F	A					D		F
Approach Delay (s)		51.1			42.9			0.0			131.6	
Approach LOS		D			D			A			F	

Intersection Summary			
HCM 2000 Control Delay	77.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	635	725	0	0	650	775	390	0	165	0	0	0
Future Volume (vph)	635	725	0	0	650	775	390	0	165	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1641	3282			3438	1538	1656		1482			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1641	3282			3438	1538	1656		1482			
Peak-hour factor, PHF	0.87	0.87	0.87	0.90	0.90	0.90	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	730	833	0	0	722	861	500	0	212	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	120	0	0	0
Lane Group Flow (vph)	730	833	0	0	722	861	500	0	92	0	0	0
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	9%	9%	9%	2%	2%	2%
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Actuated Green, G (s)	56.0	90.0			28.0	140.0	38.0		38.0			
Effective Green, g (s)	56.0	90.0			28.0	140.0	38.0		38.0			
Actuated g/C Ratio	0.40	0.64			0.20	1.00	0.27		0.27			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Lane Grp Cap (vph)	656	2109			687	1538	449		402			
v/s Ratio Prot	c0.44	0.25			c0.21		c0.30		0.06			
v/s Ratio Perm						0.56						
v/c Ratio	1.11	0.39			1.05	0.56	1.11		0.23			
Uniform Delay, d1	42.0	12.0			56.0	0.0	51.0		39.6			
Progression Factor	0.22	0.02			1.00	1.00	1.00		1.00			
Incremental Delay, d2	58.7	0.3			48.5	1.5	77.2		0.3			
Delay (s)	67.9	0.6			104.5	1.5	128.2		39.9			
Level of Service	E	A			F	A	F		D			
Approach Delay (s)		32.0			48.5			101.9			0.0	
Approach LOS		C			D			F			A	

Intersection Summary			
HCM 2000 Control Delay	51.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	5	0	240	0	0	0	250	690	5	5	1755	5
Future Volume (vph)	5	0	240	0	0	0	250	690	5	5	1755	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0				6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00				1.00	0.95		1.00	0.95	
Frt		1.00	0.85				1.00	1.00		1.00	1.00	
Flt Protected		0.95	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1770	1583				1770	3536		1770	3538	
Flt Permitted		1.00	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1863	1583				1770	3536		1770	3538	
Peak-hour factor, PHF	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	0	261	0	0	0	272	750	5	5	1908	5
RTOR Reduction (vph)	0	0	98	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	5	163	0	0	0	272	755	0	5	1913	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	custom				Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Actuated Green, G (s)		1.2	61.1				17.7	77.9		0.9	61.1	
Effective Green, g (s)		1.2	61.1				17.7	77.9		0.9	61.1	
Actuated g/C Ratio		0.01	0.62				0.18	0.79		0.01	0.62	
Clearance Time (s)		6.0	6.0				6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0				3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		22	986				319	2810		16	2205	
v/s Ratio Prot							c0.15	0.21		0.00	c0.54	
v/s Ratio Perm		c0.00	0.10									
v/c Ratio		0.23	0.17				0.85	0.27		0.31	0.87	
Uniform Delay, d1		47.9	7.7				38.9	2.6		48.2	15.1	
Progression Factor		1.00	1.00				1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.2	0.1				19.2	0.1		10.9	3.9	
Delay (s)		53.2	7.8				58.1	2.7		59.1	19.0	
Level of Service		D	A				E	A		E	B	
Approach Delay (s)		8.7			0.0			17.4			19.1	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	15	5	345	0	35	0	453	180	5	790	0
Future Volume (vph)	0	15	5	345	0	35	0	453	180	5	790	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.99			0.96			1.00	
Flt Protected		1.00			0.96			1.00			1.00	
Satd. Flow (prot)		1802			1743			1692			1809	
Flt Permitted		1.00			0.72			1.00			1.00	
Satd. Flow (perm)		1802			1315			1692			1802	
Peak-hour factor, PHF	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	0	25	8	359	0	36	0	509	202	6	919	0
RTOR Reduction (vph)	0	6	0	0	25	0	0	16	0	0	0	0
Lane Group Flow (vph)	0	27	0	0	370	0	0	695	0	0	925	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Turn Type		NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Actuated Green, G (s)		26.1			26.1			49.1			49.1	
Effective Green, g (s)		26.1			26.1			49.1			49.1	
Actuated g/C Ratio		0.30			0.30			0.56			0.56	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		539			393			952			1014	
v/s Ratio Prot		0.02						0.41				
v/s Ratio Perm					c0.28						c0.51	
v/c Ratio		0.05			0.94			0.73			0.91	
Uniform Delay, d1		21.7			29.8			14.1			17.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.0			30.6			2.8			12.1	
Delay (s)		21.8			60.4			17.0			29.2	
Level of Service		C			E			B			C	
Approach Delay (s)		21.8			60.4			17.0			29.2	
Approach LOS		C			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	87.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	235	90	35	520	80	90	160	40	70	125	115
Future Volume (vph)	80	235	90	35	520	80	90	160	40	70	125	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1656	1671		1703	1757		1719	1755		1703	1792	1524
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1656	1671		1703	1757		1719	1755		1703	1792	1524
Peak-hour factor, PHF	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.91	0.91	0.91
Adj. Flow (vph)	83	245	94	37	553	85	106	188	47	77	137	126
RTOR Reduction (vph)	0	16	0	0	6	0	0	12	0	0	0	102
Lane Group Flow (vph)	83	323	0	37	632	0	106	223	0	77	137	24
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	5%	5%	5%	6%	6%	6%
Parking (#/hr)			0									
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	4.6	29.7		3.4	28.5		4.0	14.4		4.0	14.4	14.4
Effective Green, g (s)	4.6	29.7		3.4	28.5		4.0	14.4		4.0	14.4	14.4
Actuated g/C Ratio	0.06	0.39		0.05	0.38		0.05	0.19		0.05	0.19	0.19
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	100	657		76	663		91	334		90	341	290
v/s Ratio Prot	c0.05	0.19		0.02	c0.36		c0.06	c0.13		0.05	0.08	
v/s Ratio Perm												0.02
v/c Ratio	0.83	0.49		0.49	0.95		1.16	0.67		0.86	0.40	0.08
Uniform Delay, d1	35.1	17.2		35.2	22.8		35.8	28.3		35.5	26.8	25.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	40.8	0.6		4.8	23.8		145.5	5.0		50.6	0.8	0.1
Delay (s)	75.9	17.8		40.0	46.7		181.2	33.3		86.1	27.6	25.2
Level of Service	E	B		D	D		F	C		F	C	C
Approach Delay (s)		29.2			46.3			79.3			40.0	
Approach LOS		C			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	47.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	75.5	Sum of lost time (s)	24.0
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	490	0	0	85	175	395
Future Volume (vph)	490	0	0	85	175	395
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.906	
Flt Protected	0.950					
Satd. Flow (prot)	1719	0	0	1827	1688	0
Flt Permitted	0.950					
Satd. Flow (perm)	1719	0	0	1827	1688	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	322			309	249	
Travel Time (s)	7.3			7.0	5.7	
Peak Hour Factor	0.89	0.89	0.91	0.91	0.93	0.93
Heavy Vehicles (%)	5%	5%	4%	4%	2%	2%
Adj. Flow (vph)	551	0	0	93	188	425
Shared Lane Traffic (%)						
Lane Group Flow (vph)	551	0	0	93	613	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 67.3%		ICU Level of Service C	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	490	0	0	85	175	395
Future Volume (Veh/h)	490	0	0	85	175	395
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.91	0.91	0.93	0.93
Hourly flow rate (vph)	551	0	0	93	188	425
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	494	400	613			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	494	400	613			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	100			
cM capacity (veh/h)	530	643	957			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	551	93	613
Volume Left	551	0	0
Volume Right	0	0	425
cSH	530	957	1700
Volume to Capacity	1.04	0.00	0.36
Queue Length 95th (ft)	394	0	0
Control Delay (s)	78.0	0.0	0.0
Lane LOS	F		
Approach Delay (s)	78.0	0.0	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	34.2		
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	0	0	520	565	15
Future Volume (vph)	5	0	0	520	565	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.996	
Flt Protected	0.950					
Satd. Flow (prot)	1008	0	0	1827	1785	0
Flt Permitted	0.950					
Satd. Flow (perm)	1008	0	0	1827	1785	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	160			224	319	
Travel Time (s)	3.6			5.1	7.3	
Peak Hour Factor	0.44	0.44	0.95	0.95	0.96	0.96
Heavy Vehicles (%)	79%	79%	4%	4%	6%	6%
Adj. Flow (vph)	11	0	0	547	589	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	0	0	547	605	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 40.6%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	0	0	520	565	15
Future Volume (Veh/h)	5	0	0	520	565	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.44	0.44	0.95	0.95	0.96	0.96
Hourly flow rate (vph)	11	0	0	547	589	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1144	597	605			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1144	597	605			
tC, single (s)	7.2	7.0	4.1			
tC, 2 stage (s)						
tF (s)	4.2	4.0	2.2			
p0 queue free %	93	100	100			
cM capacity (veh/h)	158	386	963			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	11	547	605
Volume Left	11	0	0
Volume Right	0	0	16
cSH	158	963	1700
Volume to Capacity	0.07	0.00	0.36
Queue Length 95th (ft)	6	0	0
Control Delay (s)	29.5	0.0	0.0
Lane LOS	D		
Approach Delay (s)	29.5	0.0	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	40.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	40	465	5	0	490	0	0	5	65	10	5	20
Future Volume (vph)	40	465	5	0	490	0	0	5	65	10	5	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	0		0	150		150
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999						0.875			0.922	
Flt Protected		0.996									0.986	
Satd. Flow (prot)	0	1767	0	0	1810	0	0	1630	0	0	1727	0
Flt Permitted		0.996									0.986	
Satd. Flow (perm)	0	1767	0	0	1810	0	0	1630	0	0	1727	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		327			240			246			251	
Travel Time (s)		7.4			5.5			5.6			5.7	
Peak Hour Factor	0.89	0.89	0.89	0.96	0.96	0.96	0.65	0.65	0.65	0.67	0.67	0.67
Heavy Vehicles (%)	7%	7%	7%	5%	5%	5%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	45	522	6	0	510	0	0	8	100	15	7	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	573	0	0	510	0	0	108	0	0	52	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 71.5%		ICU Level of Service C	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	40	465	5	0	490	0	0	5	65	10	5	20
Future Volume (Veh/h)	40	465	5	0	490	0	0	5	65	10	5	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.96	0.96	0.96	0.65	0.65	0.65	0.67	0.67	0.67
Hourly flow rate (vph)	45	522	6	0	510	0	0	8	100	15	7	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	510			528			1158	1128	510	1129	1125	525
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	510			528			1158	1128	510	1129	1125	525
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			100	96	82	89	96	95
cM capacity (veh/h)	1030			1024			154	195	563	141	198	556

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total	573	510	108	52
Volume Left	45	0	0	15
Volume Right	6	0	100	30
cSH	1030	1024	494	266
Volume to Capacity	0.04	0.00	0.22	0.20
Queue Length 95th (ft)	3	0	21	18
Control Delay (s)	1.2	0.0	14.3	21.8
Lane LOS	A		B	C
Approach Delay (s)	1.2	0.0	14.3	21.8
Approach LOS			B	C

Intersection Summary				
Average Delay	2.7			
Intersection Capacity Utilization	71.5%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	150	120	295	160	0	65	276	0	135	525	295
Future Volume (vph)	0	150	120	295	160	0	65	276	0	135	525	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor		0.95	1.00	0.97	0.95		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00		1.00	1.00		1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		3471	1553	3335	3438		1752	1845		1752	1845	1568
Flt Permitted		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		3471	1553	3335	3438		1752	1845		1752	1845	1568
Peak-hour factor, PHF	0.84	0.84	0.84	0.79	0.79	0.79	0.86	0.86	0.86	0.99	0.99	0.99
Adj. Flow (vph)	0	179	143	373	203	0	76	321	0	136	530	298
RTOR Reduction (vph)	0	0	101	0	0	0	0	0	0	0	0	169
Lane Group Flow (vph)	0	179	42	373	203	0	76	321	0	136	530	129
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	5	2		1	6		7	4		3	8	8 1
Permitted Phases		2	2		6	6		4	Free		8	
Actuated Green, G (s)		26.7	26.7	15.1	32.8		6.4	16.2		8.0	17.8	38.9
Effective Green, g (s)		26.7	26.7	15.1	32.8		6.4	16.2		8.0	17.8	38.9
Actuated g/C Ratio		0.30	0.30	0.17	0.36		0.07	0.18		0.09	0.20	0.43
Clearance Time (s)		6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1029	460	559	1252		124	332		155	364	677
v/s Ratio Prot		0.05		c0.11	c0.06		0.04	0.17		c0.08	c0.29	0.08
v/s Ratio Perm			0.03									
v/c Ratio		0.17	0.09	0.67	0.16		0.61	0.97		0.88	1.46	0.19
Uniform Delay, d1		23.5	22.9	35.1	19.3		40.6	36.6		40.5	36.1	15.8
Progression Factor		1.00	1.00	1.20	0.56		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.4	0.4	2.9	0.3		8.7	40.1		38.7	220.0	0.1
Delay (s)		23.8	23.3	45.1	11.0		49.3	76.8		79.2	256.1	15.9
Level of Service		C	C	D	B		D	E		E	F	B
Approach Delay (s)		23.6			33.1			71.5			156.9	
Approach LOS		C			C			E			F	

Intersection Summary			
HCM 2000 Control Delay	91.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	75	70	500	220	65	775
Future Volume (vph)	75	70	500	220	65	775
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	150		0	0	
Storage Lanes	0	1		1	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.850		0.850		
Flt Protected	0.950					0.996
Satd. Flow (prot)	1770	1583	1845	1568	0	3525
Flt Permitted	0.950					0.996
Satd. Flow (perm)	1770	1583	1845	1568	0	3525
Link Speed (mph)	30		30			30
Link Distance (ft)	408		387			233
Travel Time (s)	9.3		8.8			5.3
Peak Hour Factor	0.83	0.83	0.86	0.86	0.81	0.81
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Adj. Flow (vph)	90	84	581	256	80	957
Shared Lane Traffic (%)						
Lane Group Flow (vph)	90	84	581	256	0	1037
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.8%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (veh/h)	75	70	500	220	65	775
Future Volume (Veh/h)	75	70	500	220	65	775
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.86	0.86	0.81	0.81
Hourly flow rate (vph)	90	84	581	256	80	957
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type			None			TWLTL
Median storage veh)						2
Upstream signal (ft)			387			
pX, platoon unblocked	0.86	0.86			0.86	
vC, conflicting volume	1220	581			581	
vC1, stage 1 conf vol	581					
vC2, stage 2 conf vol	638					
vCu, unblocked vol	1176	437			437	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	75	83			92	
cM capacity (veh/h)	363	490			968	

Direction, Lane #	NW 1	NE 1	NE 2	SW 1	SW 2
Volume Total	174	581	256	399	638
Volume Left	90	0	0	80	0
Volume Right	84	0	256	0	0
cSH	701	1700	1700	968	1700
Volume to Capacity	0.25	0.34	0.15	0.08	0.38
Queue Length 95th (ft)	24	0	0	7	0
Control Delay (s)	16.1	0.0	0.0	2.6	0.0
Lane LOS	C			A	
Approach Delay (s)	16.1	0.0		1.0	
Approach LOS	C				

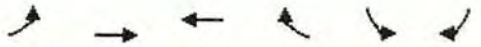
Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	63.8%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	45	595	0	0	465	30	0	0	0	25	0	400
Future Volume (vph)	45	595	0	0	465	30	0	0	0	25	0	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0						6.0	6.0
Lane Util. Factor	1.00	0.95			0.95						1.00	1.00
Frt	1.00	1.00			0.99						1.00	0.85
Flt Protected	0.95	1.00			1.00						0.95	1.00
Satd. Flow (prot)	1687	3374			3507						1787	1599
Flt Permitted	0.95	1.00			1.00						0.76	1.00
Satd. Flow (perm)	1687	3374			3507						1424	1599
Peak-hour factor, PHF	0.83	0.83	0.83	0.92	0.92	0.92	0.50	0.50	0.50	0.90	0.90	0.90
Adj. Flow (vph)	54	717	0	0	505	33	0	0	0	28	0	444
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	0	269
Lane Group Flow (vph)	54	717	0	0	534	0	0	0	0	0	28	175
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA				Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases					6		8	8	8	4		4
Actuated Green, G (s)	5.2	62.9			51.7						15.1	15.1
Effective Green, g (s)	5.2	62.9			51.7						15.1	15.1
Actuated g/C Ratio	0.06	0.70			0.57						0.17	0.17
Clearance Time (s)	6.0	6.0			6.0						6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0						3.0	3.0
Lane Grp Cap (vph)	97	2358			2014						238	268
v/s Ratio Prot	c0.03	c0.21			0.15							
v/s Ratio Perm											0.02	c0.11
v/c Ratio	0.56	0.30			0.27						0.12	0.65
Uniform Delay, d1	41.3	5.2			9.6						31.8	35.0
Progression Factor	1.01	1.33			1.34						1.00	1.00
Incremental Delay, d2	6.4	0.3			0.1						0.2	5.6
Delay (s)	48.1	7.2			12.9						32.0	40.6
Level of Service	D	A			B						C	D
Approach Delay (s)		10.0			12.9			0.0			40.1	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	630	5	5	405	215	10	5	5	180	5	100
Future Volume (vph)	105	630	5	5	405	215	10	5	5	180	5	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00		1.00	0.95		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	3303	3402		1736	3291		1805	1758		1665	1674	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	3303	3402		1736	3291		1805	1758		1665	1674	1568
Peak-hour factor, PHF	0.83	0.83	0.83	0.97	0.97	0.97	0.67	0.67	0.67	0.90	0.90	0.90
Adj. Flow (vph)	127	759	6	5	418	222	15	7	7	200	6	111
RTOR Reduction (vph)	0	0	0	0	81	0	0	7	0	0	0	79
Lane Group Flow (vph)	127	765	0	5	559	0	15	7	0	102	104	32
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases								3				
Actuated Green, G (s)	8.8	49.1		1.3	41.6		4.1	4.1		11.5	11.5	26.3
Effective Green, g (s)	8.8	49.1		1.3	41.6		4.1	4.1		11.5	11.5	26.3
Actuated g/C Ratio	0.10	0.55		0.01	0.46		0.05	0.05		0.13	0.13	0.29
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	322	1855		25	1521		82	80		212	213	458
v/s Ratio Prot	c0.04	c0.22		0.00	0.17		c0.01	0.00		0.06	c0.06	0.02
v/s Ratio Perm												
v/c Ratio	0.39	0.41		0.20	0.37		0.18	0.09		0.48	0.49	0.07
Uniform Delay, d1	38.1	12.0		43.8	15.7		41.3	41.2		36.5	36.5	23.0
Progression Factor	1.00	1.00		1.17	0.60		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	0.1		3.6	0.6		1.1	0.5		1.7	1.8	0.1
Delay (s)	38.9	12.1		55.1	10.1		42.4	41.7		38.2	38.3	23.1
Level of Service	D	B		E	B		D	D		D	D	C
Approach Delay (s)		15.9			10.4			42.1			32.9	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	15	720	645	40	80	35
Future Volume (vph)	15	720	645	40	80	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.992		0.959	
Flt Protected	0.950				0.966	
Satd. Flow (prot)	1687	1776	1812	0	1661	0
Flt Permitted	0.950				0.966	
Satd. Flow (perm)	1687	1776	1812	0	1661	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		535	210		522	
Travel Time (s)		12.2	4.8		11.9	
Peak Hour Factor	0.84	0.84	0.89	0.89	0.83	0.83
Heavy Vehicles (%)	7%	7%	4%	4%	6%	6%
Adj. Flow (vph)	18	857	725	45	96	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	857	770	0	138	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 51.1%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	720	645	40	80	35
Future Volume (Veh/h)	15	720	645	40	80	35
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.89	0.89	0.83	0.83
Hourly flow rate (vph)	18	857	725	45	96	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	770				1640	748
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	770				1640	748
tC, single (s)	4.2				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	98				9	90
cM capacity (veh/h)	823				105	406

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	18	857	770	138
Volume Left	18	0	0	96
Volume Right	0	0	45	42
cSH	823	1700	1700	136
Volume to Capacity	0.02	0.50	0.45	1.01
Queue Length 95th (ft)	2	0	0	183
Control Delay (s)	9.5	0.0	0.0	144.7
Lane LOS	A			F
Approach Delay (s)	0.2		0.0	144.7
Approach LOS				F

Intersection Summary			
Average Delay	11.3		
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	NBR2	SBL	SBT	SBR	NET	NER
Lane Configurations												
Traffic Volume (vph)	10	305	205	15	85	45	10	95	110	85	120	140
Future Volume (vph)	10	305	205	15	85	45	10	95	110	85	120	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	150	0		150		0		0		150
Storage Lanes		1	0	0		0		0		0		0
Taper Length (ft)		25		25				25				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.947			0.952				0.961		0.907	
Flt Protected		0.971			0.995				0.984			
Satd. Flow (prot)	0	1696	0	0	1747	0	0	0	1679	0	1596	0
Flt Permitted		0.971			0.995				0.984			
Satd. Flow (perm)	0	1696	0	0	1747	0	0	0	1679	0	1596	0
Link Speed (mph)		30			30				30		30	
Link Distance (ft)		465			456				371		400	
Travel Time (s)		10.6			10.4				8.4		9.1	
Peak Hour Factor	0.91	0.91	0.91	0.86	0.86	0.86	0.86	0.80	0.80	0.80	0.60	0.60
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	7%	7%	7%	8%	8%
Adj. Flow (vph)	11	335	225	17	99	52	12	119	138	106	200	233
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	571	0	0	180	0	0	0	363	0	641	0
Sign Control		Yield			Yield				Yield		Yield	

Intersection Summary			
Area Type:	Other		
Control Type: Roundabout			
Intersection Capacity Utilization 107.7%		ICU Level of Service G	
Analysis Period (min) 15			

Lane Group	NER2	SWL	SWT
Lane Configurations			↕
Traffic Volume (vph)	125	45	210
Future Volume (vph)	125	45	210
Ideal Flow (vphpl)	1900	1900	1900
Storage Length (ft)		150	
Storage Lanes		0	
Taper Length (ft)		25	
Lane Util. Factor	1.00	1.00	1.00
Frt			
Flt Protected			0.991
Satd. Flow (prot)	0	0	1760
Flt Permitted			0.991
Satd. Flow (perm)	0	0	1760
Link Speed (mph)			30
Link Distance (ft)			530
Travel Time (s)			12.0
Peak Hour Factor	0.60	0.83	0.83
Heavy Vehicles (%)	8%	7%	7%
Adj. Flow (vph)	208	54	253
Shared Lane Traffic (%)			
Lane Group Flow (vph)	0	0	307
Sign Control			Yield

Intersection Summary

Intersection	
Intersection Delay, s/veh	24.3
Intersection LOS	C

Approach	WB	NB	SB	NE
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	571	180	363	641
Demand Flow Rate, veh/h	588	186	388	693
Vehicles Circulating, veh/h	390	595	703	344
Vehicles Exiting, veh/h	391	442	334	747
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	22.9	10.0	24.5	31.9
Approach LOS	C	A	C	D

Lane	Left	Left	Left	Left
Designated Moves	LR	LTR	LTR	LTR
Assumed Moves	LR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	588	186	388	693
Cap Entry Lane, veh/h	765	623	559	801
Entry HV Adj Factor	0.971	0.968	0.936	0.925
Flow Entry, veh/h	571	180	363	641
Cap Entry, veh/h	743	603	524	741
V/C Ratio	0.769	0.298	0.694	0.865
Control Delay, s/veh	22.9	10.0	24.5	31.9
LOS	C	A	C	D
95th %tile Queue, veh	7	1	5	10

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Approach	SW
Entry Lanes	1
Conflicting Circle Lanes	1
Adj Approach Flow, veh/h	307
Demand Flow Rate, veh/h	329
Vehicles Circulating, veh/h	708
Vehicles Exiting, veh/h	270
Follow-Up Headway, s	3.186
Ped Vol Crossing Leg, #/h	0
Ped Cap Adj	1.000
Approach Delay, s/veh	19.4
Approach LOS	C

Lane	Left
Designated Moves	LTR
Assumed Moves	LTR
RT Channelized	
Lane Util	1.000
Critical Headway, s	5.193
Entry Flow, veh/h	329
Cap Entry Lane, veh/h	557
Entry HV Adj Factor	0.934
Flow Entry, veh/h	307
Cap Entry, veh/h	520
V/C Ratio	0.591
Control Delay, s/veh	19.4
LOS	C
95th %tile Queue, veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	150	0	0	0	145	135	0	0	110	30
Future Volume (Veh/h)	5	0	150	0	0	0	145	135	0	0	110	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.70	0.70	0.70	0.75	0.75	0.75	0.71	0.71	0.71
Hourly flow rate (vph)	6	0	183	0	0	0	193	180	0	0	155	42
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			1									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	742	742	176	834	763	180	197			180		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	742	742	176	834	763	180	197			180		
tC, single (s)	7.2	6.6	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	79	100	100	100	86			100		
cM capacity (veh/h)	289	289	852	199	284	855	1370			1384		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	189	0	373	197
Volume Left	6	0	193	0
Volume Right	183	0	0	42
cSH	880	1700	1370	1384
Volume to Capacity	0.21	0.00	0.14	0.00
Queue Length 95th (ft)	20	0	12	0
Control Delay (s)	10.6	0.0	4.8	0.0
Lane LOS	B	A	A	
Approach Delay (s)	10.6	0.0	4.8	0.0
Approach LOS	B	A		

Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	36.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	55	20	20	55	270	85	230	80	75	415	55
Future Volume (vph)	0	55	20	20	55	270	85	230	80	75	415	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.96		1.00	1.00	0.85	1.00	0.96		1.00	0.98	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1772		1736	1827	1553	1770	1790		1787	1848	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1772		1736	1827	1553	1770	1790		1787	1848	
Peak-hour factor, PHF	0.82	0.82	0.82	0.81	0.81	0.81	0.68	0.68	0.68	0.78	0.78	0.78
Adj. Flow (vph)	0	67	24	25	68	333	125	338	118	96	532	71
RTOR Reduction (vph)	0	15	0	0	0	143	0	15	0	0	6	0
Lane Group Flow (vph)	0	76	0	25	68	190	125	441	0	96	597	0
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases												
Actuated Green, G (s)		21.6		3.2	30.8	45.6	8.8	23.7		7.5	22.4	
Effective Green, g (s)		21.6		3.2	30.8	45.6	8.8	23.7		7.5	22.4	
Actuated g/C Ratio		0.27		0.04	0.39	0.57	0.11	0.30		0.09	0.28	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		478		69	703	885	194	530		167	517	
v/s Ratio Prot		0.04		0.01	0.04	c0.12	c0.07	0.25		0.05	c0.32	
v/s Ratio Perm												
v/c Ratio		0.16		0.36	0.10	0.21	0.64	0.83		0.57	1.16	
Uniform Delay, d1		22.3		37.4	15.7	8.4	34.1	26.3		34.7	28.8	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2		3.2	0.3	0.1	7.1	10.8		4.7	90.0	
Delay (s)		22.4		40.6	16.0	8.5	41.2	37.0		39.4	118.8	
Level of Service		C		D	B	A	D	D		D	F	
Approach Delay (s)		22.4			11.6			38.0			107.9	
Approach LOS		C			B			D			F	

Intersection Summary			
HCM 2000 Control Delay	58.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	190	0	10	135	235	465
Future Volume (Veh/h)	190	0	10	135	235	465
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.91	0.91	0.82	0.82
Hourly flow rate (vph)	202	0	11	148	287	567
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	740	570	854			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	740	570	854			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	47	100	99			
cM capacity (veh/h)	378	521	748			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	202	159	854
Volume Left	202	11	0
Volume Right	0	0	567
cSH	378	748	1700
Volume to Capacity	0.53	0.01	0.50
Queue Length 95th (ft)	76	1	0
Control Delay (s)	24.9	0.8	0.0
Lane LOS	C	A	
Approach Delay (s)	24.9	0.8	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

APPENDIX N-3: 2040 NO-BUILD INTERSECTION CAPACITY ANALYSES – SYNCHRO PRINTOUTS – AM PEAK HOUR

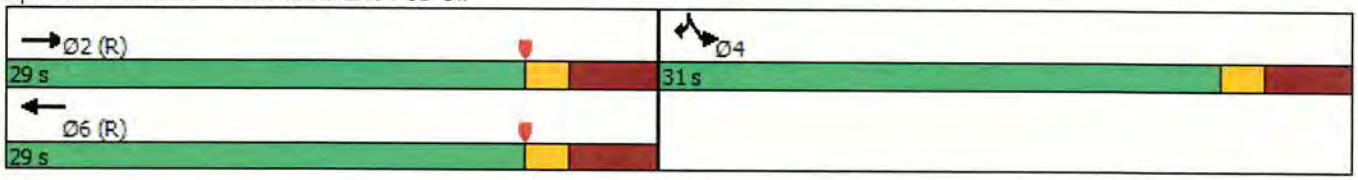
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1315	670	0	790	835
Future Volume (vph)	0	1315	670	0	790	835
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.88
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3471	3406	0	1930	2682
Flt Permitted					0.950	
Satd. Flow (perm)	0	3471	3406	0	1930	2682
Right Turn on Red				Yes		No
Satd. Flow (RTOR)						
Link Speed (mph)		30	30		25	
Link Distance (ft)		712	388		212	
Travel Time (s)		16.2	8.8		5.8	
Peak Hour Factor	0.93	0.93	0.88	0.88	0.89	0.89
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Adj. Flow (vph)	0	1414	761	0	888	938
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1414	761	0	888	938
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0		5.0	5.0
Minimum Split (s)		14.0	21.0		27.0	27.0
Total Split (s)		29.0	29.0		31.0	31.0
Total Split (%)		48.3%	48.3%		51.7%	51.7%
Maximum Green (s)		23.0	23.0		25.0	25.0
Yellow Time (s)		2.0	2.0		2.0	2.0
All-Red Time (s)		4.0	4.0		4.0	4.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		14.0	14.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		23.0	23.0		25.0	25.0
Actuated g/C Ratio		0.38	0.38		0.42	0.42
v/c Ratio		1.06	0.58		1.10	0.84
Control Delay		55.2	13.5		85.5	24.7
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		55.2	13.5		85.5	24.7
LOS		E	B		F	C

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Approach Delay		55.2	13.5		54.3	
Approach LOS		E	B		D	
Queue Length 50th (ft)		~332	95		~378	165
Queue Length 95th (ft)		m#347	m85		#566	#275
Internal Link Dist (ft)		632	308		132	
Turn Bay Length (ft)						
Base Capacity (vph)		1330	1305		804	1117
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		1.06	0.58		1.10	0.84

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 46.9 Intersection LOS: D
Intersection Capacity Utilization 92.1% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: NH 102 & Exit 4 SB Off



Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	460	0	355	0	0	1190	915	0	0	1260	1125
Future Volume (vph)	460	0	355	0	0	1190	915	0	0	1260	1125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0	0	0	550		0	0		0
Storage Lanes		2	2	0	0	2		0	0		1
Taper Length (ft)		25		25		25			25		
Lane Util. Factor	0.97	1.00	0.88	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt			0.850								0.850
Flt Protected	0.950					0.950					
Satd. Flow (prot)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Flt Permitted	0.950					0.950					
Satd. Flow (perm)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Right Turn on Red			No					Yes			Yes
Satd. Flow (RTOR)											560
Link Speed (mph)		25		30			30			30	
Link Distance (ft)		856		390			760			857	
Travel Time (s)		23.3		8.9			17.3			19.5	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Adj. Flow (vph)	523	0	403	0	0	1266	973	0	0	1370	1223
Shared Lane Traffic (%)											
Lane Group Flow (vph)	523	0	403	0	0	1266	973	0	0	1370	1223
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Detector Phase	8		2			5	2			6	
Switch Phase											
Minimum Initial (s)	10.0		10.0			5.0	8.0			8.0	
Minimum Split (s)	16.0		16.0			11.0	42.0			31.0	
Total Split (s)	23.0		23.0			47.0	97.0			50.0	
Total Split (%)	19.2%		19.2%			39.2%	80.8%			41.7%	
Maximum Green (s)	17.0		17.0			41.0	91.0			44.0	
Yellow Time (s)	2.0		2.0			2.0	2.0			2.0	
All-Red Time (s)	4.0		4.0			4.0	4.0			4.0	
Lost Time Adjust (s)	0.0		0.0			0.0	0.0			0.0	
Total Lost Time (s)	6.0		6.0			6.0	6.0			6.0	
Lead/Lag						Lead				Lag	
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Recall Mode	None		None			None	C-Min			C-Min	
Walk Time (s)							7.0			7.0	
Flash Dont Walk (s)							29.0			17.0	
Pedestrian Calls (#/hr)							0			0	
Act Effct Green (s)	17.0		17.0			41.0	91.0			44.0	120.0
Actuated g/C Ratio	0.14		0.14			0.34	0.76			0.37	1.00
v/c Ratio	1.14		1.08			1.11	0.37			1.07	0.78
Control Delay	132.3		119.1			84.7	5.7			81.8	3.9
Queue Delay	0.0		0.0			0.0	0.0			0.0	0.0

Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Total Delay	132.3		119.1			84.7	5.7			81.8	3.9
LOS	F		F			F	A			F	A
Approach Delay		126.5					50.4			45.1	
Approach LOS		F					D			D	
Queue Length 50th (ft)	~243		~198			~569	118			~616	0
Queue Length 95th (ft)	#342		#300			m#492	m107			#755	0
Internal Link Dist (ft)		776		310			680			777	
Turn Bay Length (ft)						550					
Base Capacity (vph)	459		372			1139	2607			1285	1568
Starvation Cap Reductn	0		0			0	0			0	0
Spillback Cap Reductn	0		0			0	0			0	0
Storage Cap Reductn	0		0			0	0			0	0
Reduced v/c Ratio	1.14		1.08			1.11	0.37			1.07	0.78

Intersection Summary

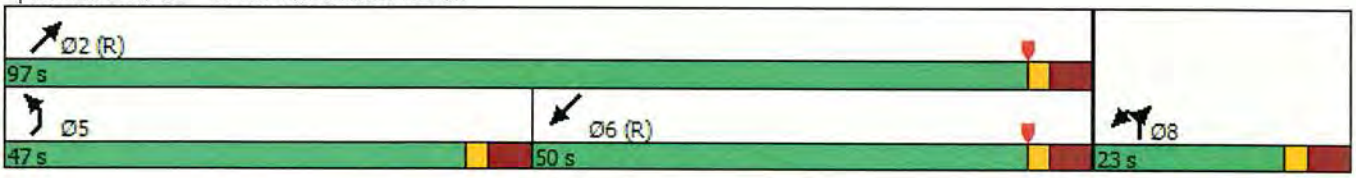
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 13 (11%), Referenced to phase 2:NET and 6:SWT, Start of Yellow
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 60.2 Intersection LOS: E
Intersection Capacity Utilization 97.9% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: NH 102 & Exit 4 NB Off



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	810	360	390	650	0	0	0	0	550	0	555
Future Volume (vph)	0	810	360	390	650	0	0	0	0	550	0	555
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		350	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3167	1417	1687	3374	0	0	0	0	3303	0	1524
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	3167	1417	1687	3374	0	0	0	0	3303	0	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			326									155
Link Speed (mph)		30			30			30			35	
Link Distance (ft)		851			693			486			581	
Travel Time (s)		19.3			15.8			11.0			11.3	
Peak Hour Factor	0.92	0.92	0.92	0.73	0.73	0.73	0.92	0.92	0.92	0.74	0.74	0.74
Heavy Vehicles (%)	14%	14%	14%	7%	7%	7%	2%	2%	2%	6%	6%	6%
Adj. Flow (vph)	0	880	391	534	890	0	0	0	0	743	0	750
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	880	391	534	890	0	0	0	0	743	0	750
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Detector Phase		2		1	6					4		4
Switch Phase												
Minimum Initial (s)		9.0		4.0	9.0					4.0		4.0
Minimum Split (s)		21.0		10.0	21.0					10.0		10.0
Total Split (s)		46.0		44.0	90.0					50.0		50.0
Total Split (%)		32.9%		31.4%	64.3%					35.7%		35.7%
Maximum Green (s)		40.0		38.0	84.0					44.0		44.0
Yellow Time (s)		4.0		4.0	4.0					4.0		4.0
All-Red Time (s)		2.0		2.0	2.0					2.0		2.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0					6.0		6.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Recall Mode		C-Min		None	C-Min					None		None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		8.0			8.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)		40.0	140.0	38.0	84.0					44.0		44.0
Actuated g/C Ratio		0.29	1.00	0.27	0.60					0.31		0.31
v/c Ratio		0.97	0.28	1.17	0.44					0.72		1.28
Control Delay		73.4	0.5	111.0	1.8					47.1		171.4
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		73.4	0.5	111.0	1.8					47.1		171.4
LOS		E	A	F	A					D		F
Approach Delay		51.0			42.7						109.5	
Approach LOS		D			D						F	
Queue Length 50th (ft)		418	0	423	16					308		~765
Queue Length 95th (ft)		#558	0	m208	m13					295		#716
Internal Link Dist (ft)		771			613			406			501	
Turn Bay Length (ft)			350									
Base Capacity (vph)		904	1417	457	2024					1038		585
Starvation Cap Reductn		0	0	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.97	0.28	1.17	0.44					0.72		1.28

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 75 (54%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.28
Intersection Signal Delay: 69.1 Intersection LOS: E
Intersection Capacity Utilization 89.8% ICU Level of Service E
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Exit 5 SB On/Exit 5 SB Off & NH 28

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	635	725	0	0	650	775	390	0	165	0	0	0
Future Volume (vph)	635	725	0	0	650	775	390	0	165	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1641	3282	0	0	3438	1538	1656	0	1482	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1641	3282	0	0	3438	1538	1656	0	1482	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						635			165			
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		693			542			867			392	
Travel Time (s)		15.8			12.3			16.9			8.9	
Peak Hour Factor	0.87	0.87	0.87	0.90	0.90	0.90	0.78	0.78	0.78	0.92	0.92	0.92
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	9%	9%	9%	2%	2%	2%
Adj. Flow (vph)	730	833	0	0	722	861	500	0	212	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	730	833	0	0	722	861	500	0	212	0	0	0
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Detector Phase	5	2			6		8		8			
Switch Phase												
Minimum Initial (s)	4.0	16.0			16.0		4.0		4.0			
Minimum Split (s)	10.0	23.0			23.0		10.0		10.0			
Total Split (s)	62.0	96.0			34.0		44.0		44.0			
Total Split (%)	44.3%	68.6%			24.3%		31.4%		31.4%			
Maximum Green (s)	56.0	90.0			28.0		38.0		38.0			
Yellow Time (s)	4.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	2.0	2.0			2.0		2.0		2.0			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.0		6.0		6.0			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		10.0			10.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	56.0	90.0			28.0	140.0	38.0		38.0			
Actuated g/C Ratio	0.40	0.64			0.20	1.00	0.27		0.27			
v/c Ratio	1.11	0.39			1.05	0.56	1.11		0.41			
Control Delay	71.9	0.6			101.6	1.5	123.6		13.1			
Queue Delay	0.4	0.0			0.0	0.0	0.0		0.0			
Total Delay	72.3	0.6			101.6	1.5	123.6		13.1			
LOS	E	A			F	A	F		B			
Approach Delay		34.1			47.1			90.7				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			D			F				
Queue Length 50th (ft)	~291	2			~376	0	~520		32			
Queue Length 95th (ft)	m#267	m2			#504	0	#588		68			
Internal Link Dist (ft)		613			462			787			312	
Turn Bay Length (ft)												
Base Capacity (vph)	656	2109			687	1538	449		522			
Starvation Cap Reductn	38	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.18	0.39			1.05	0.56	1.11		0.41			

Intersection Summary

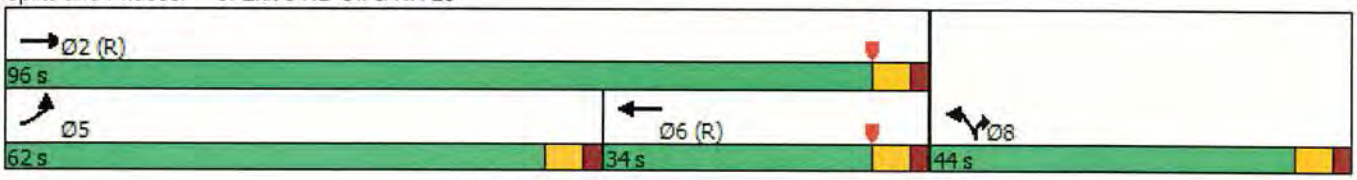
Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.11
Intersection Signal Delay: 49.9 Intersection LOS: D
Intersection Capacity Utilization 89.8% ICU Level of Service E
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Exit 5 NB Off & NH 28



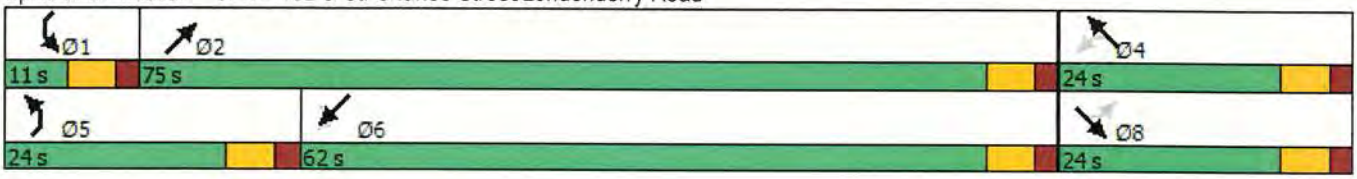
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	5	0	240	0	0	0	250	690	5	5	1755	5
Future Volume (vph)	5	0	240	0	0	0	250	690	5	5	1755	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		225	0		0	350		0	100		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850					0.999				
Flt Protected		0.950					0.950			0.950		
Satd. Flow (prot)	0	1770	1583	0	1900	0	1770	3536	0	1770	3539	0
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	1863	1583	0	1900	0	1770	3536	0	1770	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			261					1				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		593			447			750			330	
Travel Time (s)		13.5			10.2			17.0			7.5	
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	5	0	261	0	0	0	272	750	5	5	1908	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	261	0	0	0	272	755	0	5	1913	0
Turn Type	Perm	NA	custom				Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Detector Phase	8	8	6	4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	8.0	5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		24.0	24.0		11.0	24.0	
Total Split (s)	24.0	24.0	62.0	24.0	24.0		24.0	75.0		11.0	62.0	
Total Split (%)	21.8%	21.8%	56.4%	21.8%	21.8%		21.8%	68.2%		10.0%	56.4%	
Maximum Green (s)	18.0	18.0	56.0	18.0	18.0		18.0	69.0		5.0	56.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lead/Lag			Lag				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	Min	None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0			0	
Act Effct Green (s)		6.1	56.2				17.7	82.9		5.0	56.2	
Actuated g/C Ratio		0.07	0.64				0.20	0.94		0.06	0.64	
v/c Ratio		0.04	0.24				0.77	0.23		0.05	0.85	
Control Delay		41.2	1.7				50.1	1.8		43.0	18.6	
Queue Delay		0.0	0.0				0.0	0.0		0.0	0.0	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Total Delay		41.2	1.7				50.1	1.8		43.0	18.6	
LOS		D	A				D	A		D	B	
Approach Delay		2.5						14.6			18.6	
Approach LOS		A						B			B	
Queue Length 50th (ft)		3	0				138	0		3	365	
Queue Length 95th (ft)		15	33				#305	110		15	#772	
Internal Link Dist (ft)		513			367			670			250	
Turn Bay Length (ft)			225				350			100		
Base Capacity (vph)		381	1102				362	3322		100	2253	
Starvation Cap Reductn		0	0				0	0		0	0	
Spillback Cap Reductn		0	0				0	0		0	0	
Storage Cap Reductn		0	0				0	0		0	0	
Reduced v/c Ratio		0.01	0.24				0.75	0.23		0.05	0.85	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 88.2
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 16.0 Intersection LOS: B
Intersection Capacity Utilization 85.5% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: NH 102 & St. Charles Street/Londonderry Road



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	15	5	345	0	35	0	453	180	5	790	0
Future Volume (vph)	0	15	5	345	0	35	0	453	180	5	790	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967			0.988			0.962				
Flt Protected					0.957							
Satd. Flow (prot)	0	1801	0	0	1744	0	0	1692	0	0	1810	0
Flt Permitted					0.722						0.996	
Satd. Flow (perm)	0	1801	0	0	1316	0	0	1692	0	0	1802	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			36			37				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		356			493			1124			603	
Travel Time (s)		8.1			11.2			25.5			13.7	
Peak Hour Factor	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Adj. Flow (vph)	0	25	8	359	0	36	0	509	202	6	919	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	33	0	0	395	0	0	711	0	0	925	0
Turn Type		NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Detector Phase	4	4		4	4			2		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0			24.0		24.0	24.0	
Total Split (s)	33.0	33.0		33.0	33.0			57.0		57.0	57.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%			63.3%		63.3%	63.3%	
Maximum Green (s)	27.0	27.0		27.0	27.0			51.0		51.0	51.0	
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Recall Mode	None	None		None	None			Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		26.1			26.1			49.2			49.2	
Actuated g/C Ratio		0.30			0.30			0.56			0.56	
v/c Ratio		0.06			0.94			0.73			0.91	
Control Delay		18.9			61.7			19.1			32.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		18.9			61.7			19.1			32.3	
LOS		B			E			B			C	
Approach Delay		18.9			61.7			19.1			32.3	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		B			E			B			C	
Queue Length 50th (ft)		10			201			264			437	
Queue Length 95th (ft)		20			#384			399			#665	
Internal Link Dist (ft)		276			413			1044			523	
Turn Bay Length (ft)												
Base Capacity (vph)		564			434			1007			1057	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.06			0.91			0.71			0.88	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 87.3
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 33.2 Intersection LOS: C
Intersection Capacity Utilization 86.1% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: NH 102 & Fordway/Madden Hill Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	235	90	35	520	80	90	160	40	70	125	115
Future Volume (vph)	80	235	90	35	520	80	90	160	40	70	125	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.958			0.980			0.970				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1670	0	1703	1757	0	1719	1755	0	1703	1792	1524
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1656	1670	0	1703	1757	0	1719	1755	0	1703	1792	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			10			13				182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		505			530			361			411	
Travel Time (s)		11.5			12.0			8.2			9.3	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	5%	5%	5%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)			0									
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	83	245	94	37	553	85	106	188	47	77	137	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	339	0	37	638	0	106	235	0	77	137	126
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Detector Phase	5	2		1	6		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	10.0		4.0	10.0		4.0	9.0	9.0
Minimum Split (s)	10.0	30.0		10.0	30.0		10.0	25.0		10.0	25.0	25.0
Total Split (s)	11.0	41.0		12.0	42.0		12.0	25.0		12.0	25.0	25.0
Total Split (%)	12.2%	45.6%		13.3%	46.7%		13.3%	27.8%		13.3%	27.8%	27.8%
Maximum Green (s)	5.0	35.0		6.0	36.0		6.0	19.0		6.0	19.0	19.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Recall Mode	None	Min		None	Min		Min	None		Min	None	None
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)		10			10			0			10	10
Act Effct Green (s)	5.1	37.3		5.9	32.9		6.1	15.3		6.1	15.3	15.3
Actuated g/C Ratio	0.06	0.45		0.07	0.39		0.07	0.18		0.07	0.18	0.18
v/c Ratio	0.83	0.45		0.31	0.92		0.85	0.71		0.63	0.42	0.29
Control Delay	97.8	19.2		46.5	44.1		92.7	43.1		63.9	35.0	3.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	97.8	19.2		46.5	44.1		92.7	43.1		63.9	35.0	3.4
LOS	F	B		D	D		F	D		E	C	A
Approach Delay		34.7			44.2			58.6			29.8	
Approach LOS		C			D			E			C	
Queue Length 50th (ft)	46	125		20	309		59	115		42	67	0
Queue Length 95th (ft)	#136	215		51	#545		#148	179		#113	121	17
Internal Link Dist (ft)		425			450			281			331	
Turn Bay Length (ft)												
Base Capacity (vph)	100	758		123	770		124	412		123	411	490
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.83	0.45		0.30	0.83		0.85	0.57		0.63	0.33	0.26

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 83.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 42.0 — Intersection LOS: D
Intersection Capacity Utilization 71.4% — ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Birch St/Crystal Ave & NH 102 (E Broadway)

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	150	120	295	160	0	65	275	0	135	530	295
Future Volume (vph)	0	150	120	295	160	0	65	275	0	135	530	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	0		0	0		0	0		0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850									0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1827	3471	1553	3335	3438	1810	1752	1845	1845	1752	1845	1568
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1827	3471	1553	3335	3438	1810	1752	1845	1845	1752	1845	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			255									298
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		639			394			532			387	
Travel Time (s)		14.5			9.0			12.1			8.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.79	0.79	0.79	0.86	0.86	0.86	0.99	0.99	0.99
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	179	143	373	203	0	76	320	0	136	535	298
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	179	143	373	203	0	76	320	0	136	535	298
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	5	2		1	6		7	4		3	8	8 1
Permitted Phases		2	2		6	6		4	Free		8	
Detector Phase	5	2	2	1	6	6	7	4		3	8	8 1
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	6.0	8.0		7.0	8.0	
Minimum Split (s)	14.0	31.0	31.0	14.0	40.0	40.0	12.0	21.0		13.0	21.0	
Total Split (s)	14.0	33.0	33.0	22.0	41.0	41.0	12.0	22.0		13.0	23.0	
Total Split (%)	15.6%	36.7%	36.7%	24.4%	45.6%	45.6%	13.3%	24.4%		14.4%	25.6%	
Maximum Green (s)	8.0	27.0	27.0	16.0	35.0	35.0	6.0	16.0		7.0	17.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	Max	C-Max	C-Max	None	Max	Max	None	None		None	None	
Walk Time (s)		5.0	5.0		5.0	5.0		5.0			5.0	
Flash Dont Walk (s)		10.0	10.0		10.0	10.0		10.0			10.0	
Pedestrian Calls (#/hr)		0	0		0	0		0			0	
Act Effct Green (s)		28.6	28.6	14.4	35.0		6.0	16.0		7.0	19.4	39.8
Actuated g/C Ratio		0.32	0.32	0.16	0.39		0.07	0.18		0.08	0.22	0.44
v/c Ratio		0.16	0.21	0.70	0.15		0.66	0.98		1.00	1.35	0.35
Control Delay		23.1	0.7	51.0	9.6		68.3	82.9		122.0	204.2	3.2
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		23.1	0.7	51.0	9.6		68.3	82.9		122.0	204.2	3.2
LOS		C	A	D	A		E	F		F	F	A
Approach Delay		13.2			36.4			80.1			130.9	
Approach LOS		B			D			F			F	
Queue Length 50th (ft)		38	0	120	25		43	183		79	~431	0
Queue Length 95th (ft)		60	0	112	3		#102	#324		#195	#626	45
Internal Link Dist (ft)		559			314			452			307	
Turn Bay Length (ft)			150									
Base Capacity (vph)		1104	668	592	1337		116	328		136	397	882
Starvation Cap Reductn		0	0	0	0		0	0		0	0	0
Spillback Cap Reductn		0	0	0	0		0	0		0	0	0
Storage Cap Reductn		0	0	0	0		0	0		0	0	0
Reduced v/c Ratio		0.16	0.21	0.63	0.15		0.66	0.98		1.00	1.35	0.34

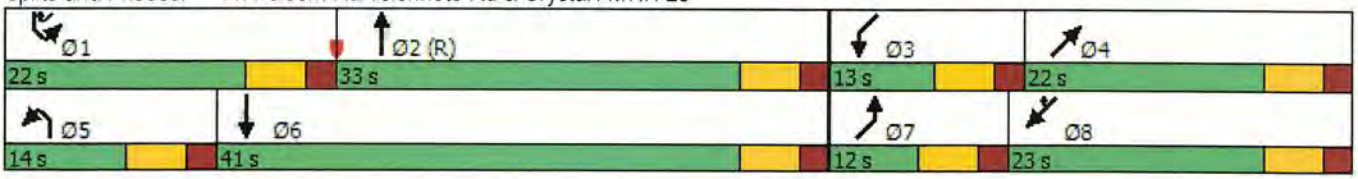
Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.35
Intersection Signal Delay: 81.2 Intersection LOS: F
Intersection Capacity Utilization 68.0% ICU Level of Service C
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Folsom Rd/Tsienneto Rd & Crystal Av/NH 28



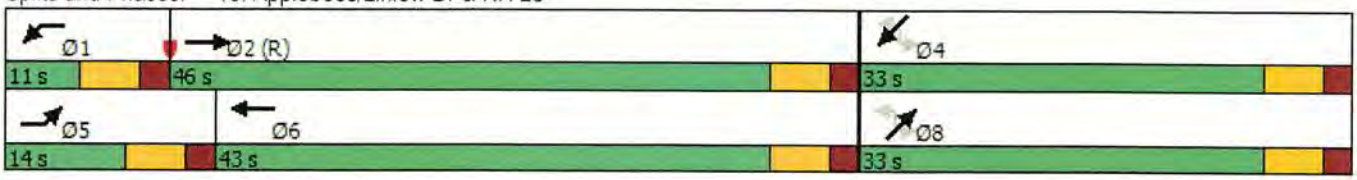
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	45	595	0	0	465	30	0	0	0	25	0	400
Future Volume (vph)	45	595	0	0	465	30	0	0	0	25	0	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	75		0	150		150	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.991							0.850
Flt Protected	0.950										0.950	
Satd. Flow (prot)	1687	3374	0	1863	3507	0	0	1900	1900	0	1787	1599
Flt Permitted	0.950										0.757	
Satd. Flow (perm)	1687	3374	0	1863	3507	0	0	1900	1900	0	1424	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					9							323
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		277			755			218			433	
Travel Time (s)		6.3			17.2			5.0			9.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.83	0.83	0.83	0.92	0.92	0.92	0.50	0.50	0.50	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	54	717	0	0	505	33	0	0	0	28	0	444
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	717	0	0	538	0	0	0	0	0	28	444
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Turn Type	Prot	NA		Prot	NA				Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases					6		8	8	8	4		4
Detector Phase	5	2		1	6		8	8	8	4	4	4
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Minimum Initial (s)	8.0	8.0		5.0	8.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	46.0		11.0	43.0		33.0	33.0	33.0	33.0	33.0	33.0
Total Split (s)	14.0	46.0		11.0	43.0		33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	15.6%	51.1%		12.2%	47.8%		36.7%	36.7%	36.7%	36.7%	36.7%	36.7%
Maximum Green (s)	8.0	40.0		5.0	37.0		27.0	27.0	27.0	27.0	27.0	27.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	8.4	62.9			54.1						15.1	15.1
Actuated g/C Ratio	0.09	0.70			0.60						0.17	0.17
v/c Ratio	0.35	0.30			0.25						0.12	0.83
Control Delay	44.8	8.9			15.0						28.3	22.9
Queue Delay	0.0	0.0			0.0						0.0	0.0
Total Delay	44.8	8.9			15.0						28.3	22.9
LOS	D	A			B						C	C
Approach Delay		11.4			15.0						23.3	
Approach LOS		B			B						C	
Queue Length 50th (ft)	32	52			101						14	63
Queue Length 95th (ft)	66	214			175						31	152
Internal Link Dist (ft)		197			675			138			353	
Turn Bay Length (ft)	75											
Base Capacity (vph)	156	2356			2111						427	705
Starvation Cap Reductn	0	0			0						0	0
Spillback Cap Reductn	0	0			0						0	0
Storage Cap Reductn	0	0			0						0	0
Reduced v/c Ratio	0.35	0.30			0.25						0.07	0.63

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 63 (70%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 15.6 Intersection LOS: B
Intersection Capacity Utilization 48.6% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 13: Applebees/Linlew Dr & NH 28



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	630	5	5	405	215	10	5	5	180	5	100
Future Volume (vph)	105	630	5	5	405	215	10	5	5	180	5	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		150	0		0	0		0
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (ft)	200			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor												
Frt		0.999			0.948			0.925				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.955	
Satd. Flow (prot)	3303	3402	0	1736	3291	0	1805	1758	0	1665	1674	1568
Flt Permitted	0.950			0.950			0.950			0.950	0.955	
Satd. Flow (perm)	3303	3402	0	1736	3291	0	1805	1758	0	1665	1674	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			151			7				111
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		412			486			151			343	
Travel Time (s)		9.4			11.0			3.4			7.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.83	0.83	0.83	0.97	0.97	0.97	0.67	0.67	0.67	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	127	759	6	5	418	222	15	7	7	200	6	111
Shared Lane Traffic (%)										49%		
Lane Group Flow (vph)	127	765	0	5	640	0	15	14	0	102	104	111
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases								3				
Detector Phase	5	2		1	6		3	3		4	4	4 5
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	5.0		8.0	8.0	
Minimum Split (s)	14.0	53.0		11.0	50.0		11.0	11.0		15.0	15.0	
Total Split (s)	14.0	53.0		11.0	50.0		11.0	11.0		15.0	15.0	
Total Split (%)	15.6%	58.9%		12.2%	55.6%		12.2%	12.2%		16.7%	16.7%	
Maximum Green (s)	8.0	47.0		5.0	44.0		5.0	5.0		9.0	9.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	Min		None	C-Min		None	None		None	None	
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	8.8	56.3		5.9	44.0		6.3	6.3		11.5	11.5	26.3
Actuated g/C Ratio	0.10	0.63		0.07	0.49		0.07	0.07		0.13	0.13	0.29
v/c Ratio	0.39	0.36		0.04	0.38		0.12	0.11		0.48	0.49	0.21
Control Delay	41.3	11.5		46.8	8.4		40.8	30.0		43.5	43.7	5.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	41.3	11.5		46.8	8.4		40.8	30.0		43.5	43.7	5.2
LOS	D	B		D	A		D	C		D	D	A
Approach Delay		15.7			8.7			35.6			30.1	
Approach LOS		B			A			D			C	
Queue Length 50th (ft)	35	105		3	53		8	4		57	58	0
Queue Length 95th (ft)	56	206		m8	77		20	16		104	106	33
Internal Link Dist (ft)		332			406			71			263	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	336	2212		113	1856		127	130		215	216	525
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.38	0.35		0.04	0.34		0.12	0.11		0.47	0.48	0.21

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 6:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 16.0		Intersection LOS: B	
Intersection Capacity Utilization 49.0%		ICU Level of Service A	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: VIP Dr/Ashleigh Dr & NH 28

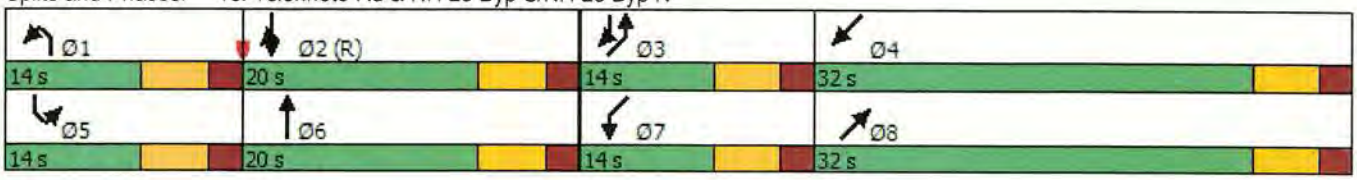
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	100	55	20	20	55	270	85	230	80	75	415	55
Future Volume (vph)	100	55	20	20	55	270	85	230	80	75	415	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		150	150		150	150		150
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.960				0.850		0.961			0.982	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1771	0	1736	1827	1553	1770	1790	0	1787	1847	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1771	0	1736	1827	1553	1770	1790	0	1787	1847	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20				148		23			9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		481			347			479			371	
Travel Time (s)		10.9			7.9			10.9			8.4	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.82	0.82	0.81	0.81	0.81	0.68	0.68	0.68	0.78	0.78	0.78
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	122	67	24	25	68	333	125	338	118	96	532	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	122	91	0	25	68	333	125	456	0	96	603	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases												
Detector Phase	1	6		5	2	2 3	3	8		7	4	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	20.0		14.0	20.0		14.0	20.0		14.0	20.0	
Total Split (s)	14.0	20.0		14.0	20.0		14.0	32.0		14.0	32.0	
Total Split (%)	17.5%	25.0%		17.5%	25.0%		17.5%	40.0%		17.5%	40.0%	
Maximum Green (s)	8.0	14.0		8.0	14.0		8.0	26.0		8.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	None		None	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	8.0	22.4		8.0	14.0	28.0	8.0	28.8		8.0	26.0	
Actuated g/C Ratio	0.10	0.28		0.10	0.18	0.35	0.10	0.36		0.10	0.32	
v/c Ratio	0.70	0.18		0.14	0.21	0.52	0.71	0.69		0.54	1.00	
Control Delay	57.5	21.6		35.1	30.3	14.5	58.0	28.9		46.3	64.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	57.5	21.6		35.1	30.3	14.5	58.0	28.9		46.3	64.3	
LOS	E	C		D	C	B	E	C		D	E	
Approach Delay		42.2			18.2			35.2			61.8	
Approach LOS		D			B			D			E	
Queue Length 50th (ft)	60	24		12	29	67	62	193		46	293	
Queue Length 95th (ft)	#119	64		31	58	118	86	202		80	#399	
Internal Link Dist (ft)		401			267			399			291	
Turn Bay Length (ft)	150			150		150	150			150		
Base Capacity (vph)	175	510		173	319	639	177	659		178	606	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.70	0.18		0.14	0.21	0.52	0.71	0.69		0.54	1.00	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 41.9		Intersection LOS: D	
Intersection Capacity Utilization 63.6%		ICU Level of Service B	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: Tsienneto Rd & NH 28 Byp S/NH 28 Byp N



APPENDIX N-4: 2040 NO-BUILD INTERSECTION CAPACITY ANALYSES – SYNCHRO PRINTOUTS – PM PEAK HOUR

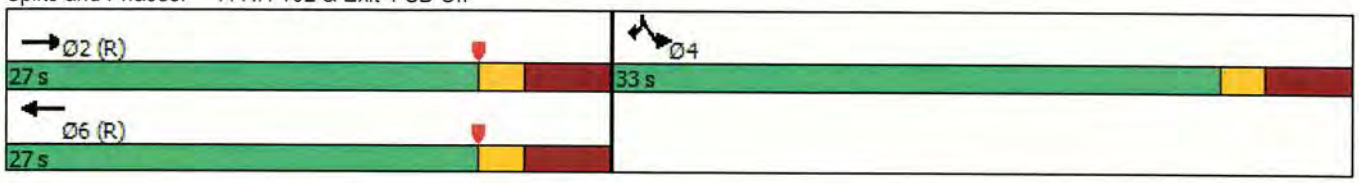
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1260	1320	0	925	1175
Future Volume (vph)	0	1260	1320	0	925	1175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.88
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3471	3406	0	1930	2682
Flt Permitted					0.950	
Satd. Flow (perm)	0	3471	3406	0	1930	2682
Right Turn on Red				Yes		No
Satd. Flow (RTOR)						
Link Speed (mph)		30	30		25	
Link Distance (ft)		712	388		212	
Travel Time (s)		16.2	8.8		5.8	
Peak Hour Factor	0.93	0.93	0.88	0.88	0.89	0.89
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Adj. Flow (vph)	0	1355	1500	0	1039	1320
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1355	1500	0	1039	1320
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0		5.0	5.0
Minimum Split (s)		14.0	21.0		27.0	27.0
Total Split (s)		27.0	27.0		33.0	33.0
Total Split (%)		45.0%	45.0%		55.0%	55.0%
Maximum Green (s)		21.0	21.0		27.0	27.0
Yellow Time (s)		2.0	2.0		2.0	2.0
All-Red Time (s)		4.0	4.0		4.0	4.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		14.0	14.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		21.0	21.0		27.0	27.0
Actuated g/C Ratio		0.35	0.35		0.45	0.45
v/c Ratio		1.12	1.26		1.20	1.09
Control Delay		87.7	146.0		120.4	75.5
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		87.7	146.0		120.4	75.5
LOS		F	F		F	E

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Approach Delay		87.7	146.0		95.3	
Approach LOS		F	F		F	
Queue Length 50th (ft)		~403	~828		~471	~317
Queue Length 95th (ft)		m#656	m#654		#667	#435
Internal Link Dist (ft)		632	308		132	
Turn Bay Length (ft)						
Base Capacity (vph)		1214	1192		868	1206
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		1.12	1.26		1.20	1.09

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.26
Intersection Signal Delay: 107.9 Intersection LOS: F
Intersection Capacity Utilization 99.7% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: NH 102 & Exit 4 SB Off



Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	1265	0	1070	0	0	1000	1185	0	0	540	780
Future Volume (vph)	1265	0	1070	0	0	1000	1185	0	0	540	780
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0	0	0	550		0	0		0
Storage Lanes		2	2	0	0	2		0	0		1
Taper Length (ft)		25		25		25			25		
Lane Util. Factor	0.97	1.00	0.88	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt			0.850								0.850
Flt Protected	0.950					0.950					
Satd. Flow (prot)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Flt Permitted	0.950					0.950					
Satd. Flow (perm)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Right Turn on Red			No					Yes			Yes
Satd. Flow (RTOR)											750
Link Speed (mph)		25		30			30			30	
Link Distance (ft)		856		390			760			857	
Travel Time (s)		23.3		8.9			17.3			19.5	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Adj. Flow (vph)	1438	0	1216	0	0	1064	1261	0	0	587	848
Shared Lane Traffic (%)											
Lane Group Flow (vph)	1438	0	1216	0	0	1064	1261	0	0	587	848
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Detector Phase	8		2			5	2			6	
Switch Phase											
Minimum Initial (s)	10.0		10.0			5.0	8.0			8.0	
Minimum Split (s)	16.0		16.0			11.0	42.0			31.0	
Total Split (s)	50.0		50.0			38.0	70.0			32.0	
Total Split (%)	41.7%		41.7%			31.7%	58.3%			26.7%	
Maximum Green (s)	44.0		44.0			32.0	64.0			26.0	
Yellow Time (s)	2.0		2.0			2.0	2.0			2.0	
All-Red Time (s)	4.0		4.0			4.0	4.0			4.0	
Lost Time Adjust (s)	0.0		0.0			0.0	0.0			0.0	
Total Lost Time (s)	6.0		6.0			6.0	6.0			6.0	
Lead/Lag						Lead				Lag	
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Recall Mode	None		None			None	C-Min			C-Min	
Walk Time (s)							7.0			7.0	
Flash Dont Walk (s)							29.0			17.0	
Pedestrian Calls (#/hr)							0			0	
Act Effct Green (s)	44.0		44.0			32.0	64.0			26.0	120.0
Actuated g/C Ratio	0.37		0.37			0.27	0.53			0.22	1.00
v/c Ratio	1.21		1.26			1.20	0.69			0.77	0.54
Control Delay	137.3		159.2			124.5	21.6			52.2	1.3
Queue Delay	0.0		0.0			0.0	0.0			0.0	0.0

Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Total Delay	137.3		159.2			124.5	21.6			52.2	1.3
LOS	F		F			F	C			D	A
Approach Delay		147.3					68.7			22.1	
Approach LOS		F					E			C	
Queue Length 50th (ft)	~701		~671			~508	378			226	0
Queue Length 95th (ft)	#807		#790			m#393	m277			294	0
Internal Link Dist (ft)		776		310			680			777	
Turn Bay Length (ft)						550					
Base Capacity (vph)	1188		965			889	1833			759	1568
Starvation Cap Reductn	0		0			0	0			0	0
Spillback Cap Reductn	0		0			0	0			0	0
Storage Cap Reductn	0		0			0	0			0	0
Reduced v/c Ratio	1.21		1.26			1.20	0.69			0.77	0.54

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 118 (98%), Referenced to phase 2:NET and 6:SWT, Start of Yellow
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.26
Intersection Signal Delay: 90.8 Intersection LOS: F
Intersection Capacity Utilization 95.5% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: NH 102 & Exit 4 NB Off

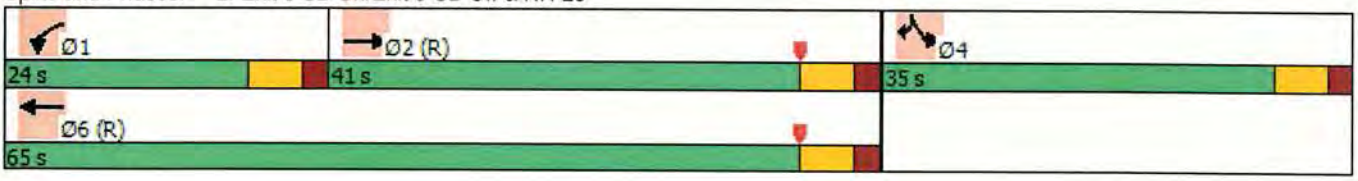
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	935	390	240	550	0	0	0	0	820	0	535
Future Volume (vph)	0	935	390	240	550	0	0	0	0	820	0	535
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		350	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3471	1553	1719	3438	0	0	0	0	3367	0	1553
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	3471	1553	1719	3438	0	0	0	0	3367	0	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			427									266
Link Speed (mph)		30			30			30			35	
Link Distance (ft)		851			693			486			581	
Travel Time (s)		19.3			15.8			11.0			11.3	
Peak Hour Factor	0.87	0.87	0.87	0.86	0.86	0.86	0.92	0.92	0.92	0.91	0.91	0.91
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	0	1075	448	279	640	0	0	0	0	901	0	588
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1075	448	279	640	0	0	0	0	901	0	588
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Detector Phase		2		1	6					4		4
Switch Phase												
Minimum Initial (s)		9.0		4.0	9.0					4.0		4.0
Minimum Split (s)		21.0		10.0	21.0					10.0		10.0
Total Split (s)		41.0		24.0	65.0					35.0		35.0
Total Split (%)		41.0%		24.0%	65.0%					35.0%		35.0%
Maximum Green (s)		35.0		18.0	59.0					29.0		29.0
Yellow Time (s)		4.0		4.0	4.0					4.0		4.0
All-Red Time (s)		2.0		2.0	2.0					2.0		2.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0					6.0		6.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Recall Mode		C-Min		None	C-Min					None		None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		8.0			8.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)		35.3	100.0	17.7	59.0					29.0		29.0
Actuated g/C Ratio		0.35	1.00	0.18	0.59					0.29		0.29
v/c Ratio		0.88	0.29	0.91	0.32					0.92		0.92
Control Delay		40.2	0.5	27.1	0.2					50.5		40.5
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		40.2	0.5	27.1	0.2					50.5		40.5
LOS		D	A	C	A					D		D
Approach Delay		28.5			8.3						46.6	
Approach LOS		C			A						D	
Queue Length 50th (ft)		336	0	5	0					286		216
Queue Length 95th (ft)		#405	0	m16	m0					#404		#438
Internal Link Dist (ft)		771			613			406			501	
Turn Bay Length (ft)			350									
Base Capacity (vph)		1223	1553	309	2028					976		639
Starvation Cap Reductn		0	0	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.88	0.29	0.90	0.32					0.92		0.92

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 56 (56%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 30.6 Intersection LOS: C
Intersection Capacity Utilization 78.5% ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Exit 5 SB On/Exit 5 SB Off & NH 28



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	605	1150	0	0	495	545	295	0	375	0	0	0
Future Volume (vph)	605	1150	0	0	495	545	295	0	375	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1752	3505	0	0	3505	1568	1703	0	1524	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1752	3505	0	0	3505	1568	1703	0	1524	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						599			98			
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		693			542			867			392	
Travel Time (s)		15.8			12.3			16.9			8.9	
Peak Hour Factor	0.92	0.92	0.92	0.91	0.91	0.91	0.67	0.67	0.67	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	6%	6%	6%	2%	2%	2%
Adj. Flow (vph)	658	1250	0	0	544	599	440	0	560	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	658	1250	0	0	544	599	440	0	560	0	0	0
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Detector Phase	5	2			6		8		8			
Switch Phase												
Minimum Initial (s)	4.0	16.0			16.0		4.0		4.0			
Minimum Split (s)	10.0	23.0			23.0		11.0		11.0			
Total Split (s)	41.0	64.0			23.0		36.0		36.0			
Total Split (%)	41.0%	64.0%			23.0%		36.0%		36.0%			
Maximum Green (s)	35.0	58.0			17.0		30.0		30.0			
Yellow Time (s)	4.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	2.0	2.0			2.0		2.0		2.0			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.0		6.0		6.0			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		10.0			10.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	35.0	58.0			17.0	100.0	30.0		30.0			
Actuated g/C Ratio	0.35	0.58			0.17	1.00	0.30		0.30			
v/c Ratio	1.07	0.62			0.91	0.38	0.86		1.07			
Control Delay	59.0	6.2			62.6	0.7	51.6		87.7			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	59.0	6.2			62.6	0.7	51.6		87.7			
LOS	E	A			E	A	D		F			
Approach Delay		24.4			30.1			71.8				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			C			E				
Queue Length 50th (ft)	~483	77			181	0	264		~350			
Queue Length 95th (ft)	m#602	m119			#280	0	258		#297			
Internal Link Dist (ft)		613			462			787			312	
Turn Bay Length (ft)												
Base Capacity (vph)	613	2032			595	1568	510		525			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.07	0.62			0.91	0.38	0.86		1.07			

Intersection Summary

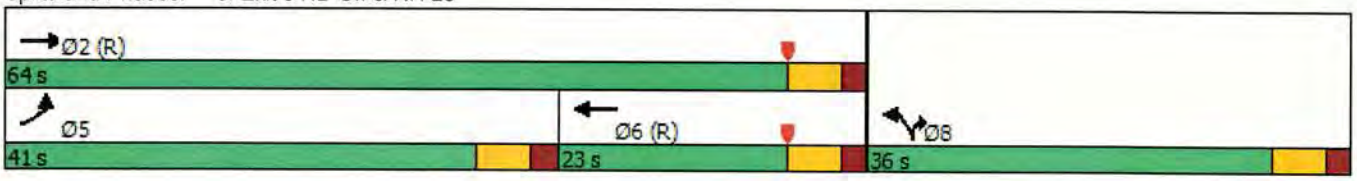
Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 37.7 Intersection LOS: D
Intersection Capacity Utilization 78.5% ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Exit 5 NB Off & NH 28



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	5	0	295	0	0	0	955	1260	0	5	1160	10
Future Volume (vph)	5	0	295	0	0	0	955	1260	0	5	1160	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		225	0		0	350		0	100		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850								0.999	
Flt Protected		0.950					0.950			0.950		
Satd. Flow (prot)	0	1770	1583	0	1900	0	1770	3539	0	1770	3536	0
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	1863	1583	0	1900	0	1770	3539	0	1770	3536	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			321								1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		593			447			750			330	
Travel Time (s)		13.5			10.2			17.0			7.5	
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	5	0	321	0	0	0	1038	1370	0	5	1261	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	321	0	0	0	1038	1370	0	5	1272	0
Turn Type	Perm	NA	custom				Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Detector Phase	8	8	6	4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	8.0	5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		24.0	24.0		11.0	24.0	
Total Split (s)	24.0	24.0	36.0	24.0	24.0		50.0	75.0		11.0	36.0	
Total Split (%)	21.8%	21.8%	32.7%	21.8%	21.8%		45.5%	68.2%		10.0%	32.7%	
Maximum Green (s)	18.0	18.0	30.0	18.0	18.0		44.0	69.0		5.0	30.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lead/Lag			Lag				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	Min	None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0			0	
Act Effct Green (s)		6.1	30.1				44.1	83.2		5.0	30.1	
Actuated g/C Ratio		0.07	0.34				0.50	0.94		0.06	0.34	
v/c Ratio		0.04	0.43				1.18	0.41		0.05	1.06	
Control Delay		41.2	4.9				115.9	2.4		43.0	73.1	
Queue Delay		0.0	0.0				0.0	0.0		0.0	0.0	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Total Delay		41.2	4.9				115.9	2.4		43.0	73.1	
LOS		D	A				F	A		D	E	
Approach Delay		5.4						51.4			72.9	
Approach LOS		A						D			E	
Queue Length 50th (ft)		3	0				~667	0		3	~393	
Queue Length 95th (ft)		15	61				#1094	245		15	#649	
Internal Link Dist (ft)		513			367			670			250	
Turn Bay Length (ft)			225				350			100		
Base Capacity (vph)		379	749				881	3324		99	1202	
Starvation Cap Reductn		0	0				0	0		0	0	
Spillback Cap Reductn		0	0				0	0		0	0	
Storage Cap Reductn		0	0				0	0		0	0	
Reduced v/c Ratio		0.01	0.43				1.18	0.41		0.05	1.06	

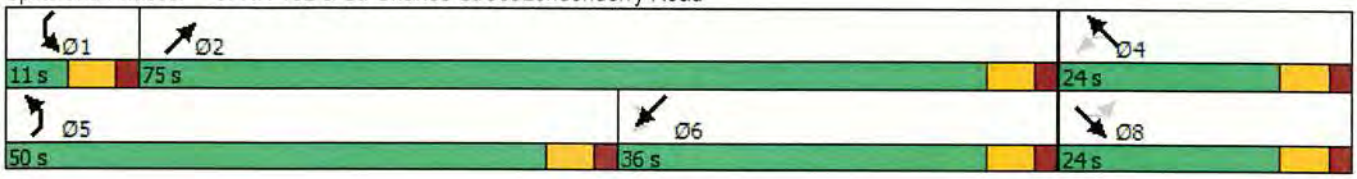
Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 88.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.18
Intersection Signal Delay: 54.5 Intersection LOS: D
Intersection Capacity Utilization 108.3% ICU Level of Service G
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: NH 102 & St. Charles Street/Londonderry Road



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	5	30	0	230	0	50	0	860	215	5	555	0
Future Volume (vph)	5	30	0	230	0	50	0	860	215	5	555	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.976			0.973				
Flt Protected		0.993			0.961							
Satd. Flow (prot)	0	1850	0	0	1730	0	0	1712	0	0	1810	0
Flt Permitted		0.957			0.724						0.754	
Satd. Flow (perm)	0	1783	0	0	1303	0	0	1712	0	0	1364	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					36			30				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		356			493			1124			603	
Travel Time (s)		8.1			11.2			25.5			13.7	
Peak Hour Factor	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Adj. Flow (vph)	8	50	0	240	0	52	0	966	242	6	645	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	58	0	0	292	0	0	1208	0	0	651	0
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Detector Phase	4	4		4	4			2		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0			24.0		24.0	24.0	
Total Split (s)	24.0	24.0		24.0	24.0			66.0		66.0	66.0	
Total Split (%)	26.7%	26.7%		26.7%	26.7%			73.3%		73.3%	73.3%	
Maximum Green (s)	18.0	18.0		18.0	18.0			60.0		60.0	60.0	
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Recall Mode	None	None		None	None			Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		18.0			18.0			60.4			60.4	
Actuated g/C Ratio		0.20			0.20			0.67			0.67	
v/c Ratio		0.16			1.01			1.05			0.71	
Control Delay		31.3			90.7			56.8			15.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		31.3			90.7			56.8			15.2	
LOS		C			F			E			B	
Approach Delay		31.3			90.7			56.8			15.1	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		C			F			E			B	
Queue Length 50th (ft)		28			~151			~751			208	
Queue Length 95th (ft)		39			#318			#982			312	
Internal Link Dist (ft)		276			413			1044			523	
Turn Bay Length (ft)												
Base Capacity (vph)		354			288			1154			911	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.16			1.01			1.05			0.71	

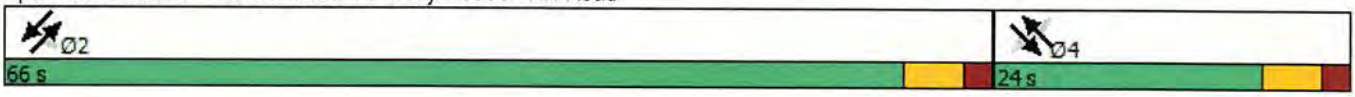
Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90.4
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.05
Intersection Signal Delay: 48.4 Intersection LOS: D
Intersection Capacity Utilization 94.1% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: NH 102 & Fordway/Madden Hill Road



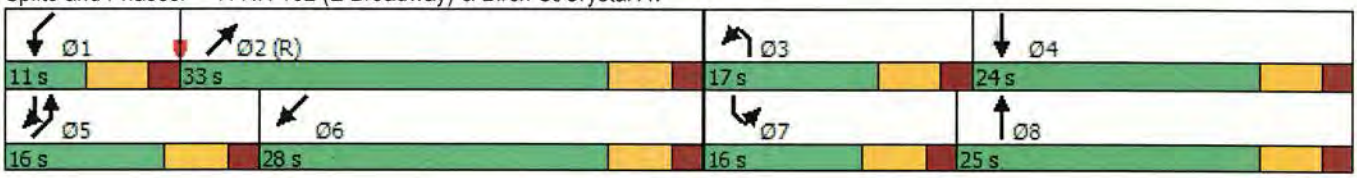
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	105	180	35	135	180	160	100	470	60	70	335	65
Future Volume (vph)	105	180	35	135	180	160	100	470	60	70	335	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.976				0.850		0.983			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1800	0	1752	1845	1568	1787	1849	0	1787	1836	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1800	0	1752	1845	1568	1787	1849	0	1787	1836	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				172		8			11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		361			411			477			530	
Travel Time (s)		8.2			9.3			10.8			12.0	
Peak Hour Factor	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95	0.94	0.94	0.94
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	115	198	38	145	194	172	105	495	63	74	356	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	115	236	0	145	194	172	105	558	0	74	425	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4	5	5	2		1	6	
Permitted Phases						4						
Detector Phase	3	8		7	4	5	5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	10.0	4.0	4.0	10.0		4.0	9.0	
Minimum Split (s)	17.0	24.0		11.0	24.0	16.0	16.0	24.0		11.0	24.0	
Total Split (s)	17.0	25.0		16.0	24.0	16.0	16.0	33.0		11.0	28.0	
Total Split (%)	20.0%	29.4%		18.8%	28.2%	18.8%	18.8%	38.8%		12.9%	32.9%	
Maximum Green (s)	11.0	19.0		10.0	18.0	10.0	10.0	27.0		5.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max		None	None	
Act Effct Green (s)	9.7	15.3		9.6	17.7	33.0	9.2	31.9		6.6	26.8	
Actuated g/C Ratio	0.11	0.18		0.11	0.21	0.39	0.11	0.38		0.08	0.32	
v/c Ratio	0.57	0.71		0.73	0.51	0.24	0.54	0.80		0.53	0.72	
Control Delay	47.2	43.0		59.2	35.6	3.7	46.3	36.8		54.4	36.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	47.2	43.0		59.2	35.6	3.7	46.3	36.8		54.4	36.0	
LOS	D	D		E	D	A	D	D		D	D	
Approach Delay		44.4			31.6			38.3			38.7	
Approach LOS		D			C			D			D	
Queue Length 50th (ft)	58	113		76	96	0	53	284		38	202	
Queue Length 95th (ft)	111	182		#162	157	37	104	#489		#109	#380	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Internal Link Dist (ft)		281			331			397			450	
Turn Bay Length (ft)												
Base Capacity (vph)	226	410		206	416	729	215	698		139	587	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.51	0.58		0.70	0.47	0.24	0.49	0.80		0.53	0.72	

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 0 (0%), Referenced to phase 2:NET, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 37.8 Intersection LOS: D
Intersection Capacity Utilization 86.2% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: NH 102 (E Broadway) & Birch St/Crystal Av



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	235	135	495	310	0	115	520	0	165	400	300
Future Volume (vph)	0	235	135	495	310	0	115	520	0	165	400	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	0		0	0		0	0		0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1863	3539	1583	3433	1863	1863	1770	1863	1863	1787	1881	1599
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1863	3539	1583	3433	1863	1863	1770	1863	1863	1787	1881	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			208									134
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		639			394			532			387	
Travel Time (s)		14.5			9.0			12.1			8.8	
Peak Hour Factor	0.92	0.92	0.92	0.94	0.94	0.94	0.96	0.96	0.96	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	0	255	147	527	330	0	120	542	0	174	421	316
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	255	147	527	330	0	120	542	0	174	421	316
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6		7	4		3	8	1
Permitted Phases			2			6			4			8
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	1
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	15.0	25.0	25.0	35.0	45.0	45.0	14.0	40.0	40.0	15.0	25.0	35.0
Total Split (s)	14.0	23.0	23.0	34.0	43.0	43.0	15.0	39.0	39.0	14.0	38.0	34.0
Total Split (%)	12.7%	20.9%	20.9%	30.9%	39.1%	39.1%	13.6%	35.5%	35.5%	12.7%	34.5%	30.9%
Maximum Green (s)	8.0	17.0	17.0	28.0	37.0	37.0	9.0	33.0	33.0	8.0	32.0	28.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	None	None	None	None	None	None	None	None
Walk Time (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)		22.3	22.3	22.7	51.0		9.0	33.0		8.0	32.0	60.7
Actuated g/C Ratio		0.20	0.20	0.21	0.46		0.08	0.30		0.07	0.29	0.55
v/c Ratio		0.36	0.30	0.74	0.38		0.83	0.97		1.35	0.77	0.34
Control Delay		40.5	3.1	56.3	23.0		91.5	70.6		239.2	46.5	7.9
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Total Delay		40.5	3.1	56.3	23.0		91.5	70.6		239.2	46.5	7.9
LOS		D	A	E	C		F	E		F	D	A
Approach Delay		26.8			43.5			74.4			69.9	
Approach LOS		C			D			E			E	
Queue Length 50th (ft)		82	0	189	160		85	377		~161	271	62
Queue Length 95th (ft)		129	17	262	206		#189	#597		#299	#398	102
Internal Link Dist (ft)		559			314			452			307	
Turn Bay Length (ft)			150									
Base Capacity (vph)		717	486	873	863		144	558		129	547	1013
Starvation Cap Reductn		0	0	0	0		0	0		0	0	0
Spillback Cap Reductn		0	0	0	0		0	0		0	0	0
Storage Cap Reductn		0	0	0	0		0	0		0	0	0
Reduced v/c Ratio		0.36	0.30	0.60	0.38		0.83	0.97		1.35	0.77	0.31

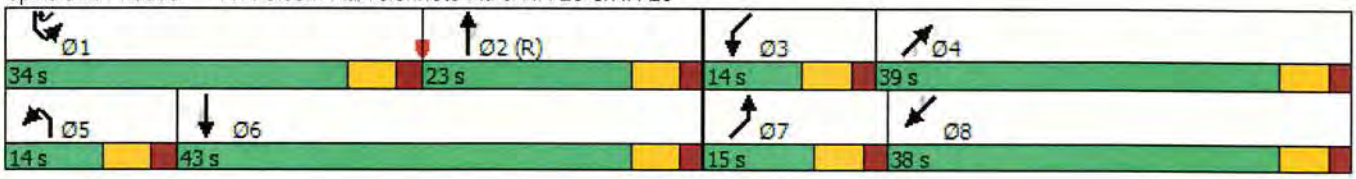
Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.35
Intersection Signal Delay: 56.9 Intersection LOS: E
Intersection Capacity Utilization 79.5% ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Folsom Rd/Tsienneto Rd & NH 28 S/NH 28



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	150	1050	0	0	605	80	0	0	0	25	0	350
Future Volume (vph)	150	1050	0	0	605	80	0	0	0	25	0	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.983							0.850
Flt Protected	0.950										0.950	
Satd. Flow (prot)	1787	3574	0	1881	3513	0	0	1900	1900	0	1787	1599
Flt Permitted	0.950										0.757	
Satd. Flow (perm)	1787	3574	0	1881	3513	0	0	1900	1900	0	1424	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					16							366
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		277			755			230			387	
Travel Time (s)		6.3			17.2			5.2			8.8	
Peak Hour Factor	0.97	0.97	0.97	0.95	0.95	0.95	0.90	0.90	0.90	0.80	0.80	0.80
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	155	1082	0	0	637	84	0	0	0	31	0	438
Shared Lane Traffic (%)												
Lane Group Flow (vph)	155	1082	0	0	721	0	0	0	0	0	31	438
Turn Type	Prot	NA		Prot	NA				Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4	4	4
Detector Phase	5	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	26.0	63.0		11.0	48.0		21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	26.0	66.0		11.0	51.0		33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	23.6%	60.0%		10.0%	46.4%		30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Maximum Green (s)	20.0	60.0		5.0	45.0		27.0	27.0	27.0	27.0	27.0	27.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0			11.0		8.0	8.0	8.0	8.0	8.0	8.0
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	0
Act Effct Green (s)	14.8	84.1			63.3						13.9	13.9
Actuated g/C Ratio	0.13	0.76			0.58						0.13	0.13
v/c Ratio	0.65	0.40			0.36						0.17	0.84
Control Delay	65.5	4.8			16.4						40.6	23.3
Queue Delay	0.0	0.0			0.0						0.0	0.0
Total Delay	65.5	4.8			16.4						40.6	23.3
LOS	E	A			B						D	C
Approach Delay		12.4			16.4						24.5	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		B			B						C	
Queue Length 50th (ft)	118	66			127						20	48
Queue Length 95th (ft)	m160	158			m192						37	90
Internal Link Dist (ft)		197			675			150			307	
Turn Bay Length (ft)												
Base Capacity (vph)	325	2732			2028						349	668
Starvation Cap Reductn	0	0			0						0	0
Spillback Cap Reductn	0	0			0						0	0
Storage Cap Reductn	0	0			0						0	0
Reduced v/c Ratio	0.48	0.40			0.36						0.09	0.66

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 15.9 Intersection LOS: B
Intersection Capacity Utilization 52.4% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Applebee's/Linlew Dr & NH 28

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	815	5	5	530	255	35	10	10	350	5	135
Future Volume (vph)	115	815	5	5	530	255	35	10	10	350	5	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	0		0	0		0
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (ft)	150			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.999			0.951			0.925				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.954	
Satd. Flow (prot)	3467	3571	0	1770	3366	0	1805	1758	0	1715	1722	1615
Flt Permitted	0.950			0.950			0.950			0.950	0.954	
Satd. Flow (perm)	3467	3571	0	1770	3366	0	1805	1758	0	1715	1722	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			88			13				157
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		877			261			151			343	
Travel Time (s)		19.9			5.9			3.4			7.8	
Peak Hour Factor	0.84	0.84	0.84	0.90	0.90	0.90	0.78	0.78	0.78	0.86	0.86	0.86
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	137	970	6	6	589	283	45	13	13	407	6	157
Shared Lane Traffic (%)										49%		
Lane Group Flow (vph)	137	976	0	6	872	0	45	26	0	208	205	157
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases		2			6							
Detector Phase	5	2		1	6		3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	5.0		8.0	8.0	
Minimum Split (s)	11.0	53.0		11.0	50.0		22.0	22.0		22.0	22.0	
Total Split (s)	14.0	53.0		11.0	50.0		22.0	22.0		24.0	24.0	
Total Split (%)	12.7%	48.2%		10.0%	45.5%		20.0%	20.0%		21.8%	21.8%	
Maximum Green (s)	8.0	47.0		5.0	44.0		16.0	16.0		18.0	18.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	None		None	None		None	None	
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	8.6	65.0		5.6	52.6		8.2	8.2		18.9	18.9	33.5
Actuated g/C Ratio	0.08	0.59		0.05	0.48		0.07	0.07		0.17	0.17	0.30
v/c Ratio	0.51	0.46		0.07	0.53		0.34	0.18		0.71	0.69	0.26
Control Delay	55.6	16.1		55.0	20.8		54.4	32.8		55.6	54.7	5.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	55.6	16.1		55.0	20.8		54.4	32.8		55.6	54.7	5.2
LOS	E	B		D	C		D	C		E	D	A
Approach Delay		20.9			21.1			46.5			41.4	
Approach LOS		C			C			D			D	
Queue Length 50th (ft)	47	195		4	150		31	9		145	143	0
Queue Length 95th (ft)	75	316		m10	215		57	30		211	208	39
Internal Link Dist (ft)		797			181			71			263	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	276	2110		90	1656		262	266		317	319	591
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.50	0.46		0.07	0.53		0.17	0.10		0.66	0.64	0.27

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 26.1 Intersection LOS: C
Intersection Capacity Utilization 58.5% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: VIP Dr/Ashleigh Dr & NH 28

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	100	80	25	55	50	195	195	800	75	25	265	40
Future Volume (vph)	100	80	25	55	50	195	195	800	75	25	265	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	150		150	150		150
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.965				0.850		0.987			0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1798	0	1787	1881	1599	1805	1875	0	1805	1862	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1798	0	1787	1881	1599	1805	1875	0	1805	1862	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				205		6			9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		481			347			479			371	
Travel Time (s)		10.9			7.9			10.9			8.4	
Peak Hour Factor	0.99	0.99	0.99	0.95	0.95	0.95	0.89	0.89	0.89	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	101	81	25	58	53	205	219	899	84	27	285	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	101	106	0	58	53	205	219	983	0	27	328	0
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases		6			2							
Detector Phase	1	6		5	2	2 3	3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	20.0		14.0	20.0		14.0	28.0		14.0	14.0	
Total Split (s)	14.0	20.0		14.0	20.0		19.0	32.0		14.0	27.0	
Total Split (%)	17.5%	25.0%		17.5%	25.0%		23.8%	40.0%		17.5%	33.8%	
Maximum Green (s)	8.0	14.0		8.0	14.0		13.0	26.0		8.0	21.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	C-Max		None	None		None	None	
Walk Time (s)								7.0				
Flash Dont Walk (s)								15.0				
Pedestrian Calls (#/hr)								0				
Act Effct Green (s)	8.0	19.6		8.0	16.8	35.2	12.4	34.4		8.0	21.6	
Actuated g/C Ratio	0.10	0.24		0.10	0.21	0.44	0.16	0.43		0.10	0.27	
v/c Ratio	0.57	0.23		0.33	0.13	0.25	0.78	1.22		0.15	0.64	
Control Delay	48.2	24.8		38.9	29.2	3.2	53.3	132.8		35.1	32.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	48.2	24.8		38.9	29.2	3.2	53.3	132.8		35.1	32.2	
LOS	D	C		D	C	A	D	F		D	C	
Approach Delay		36.2			14.1			118.3			32.4	
Approach LOS		D			B			F			C	
Queue Length 50th (ft)	49	39		28	23	0	106	~541		13	142	
Queue Length 95th (ft)	#108	84		63	53	38	#204	#939		36	230	
Internal Link Dist (ft)		401			267			399			291	
Turn Bay Length (ft)	150			150		150	150			150		
Base Capacity (vph)	177	453		178	395	829	293	809		180	509	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.57	0.23		0.33	0.13	0.25	0.75	1.22		0.15	0.64	

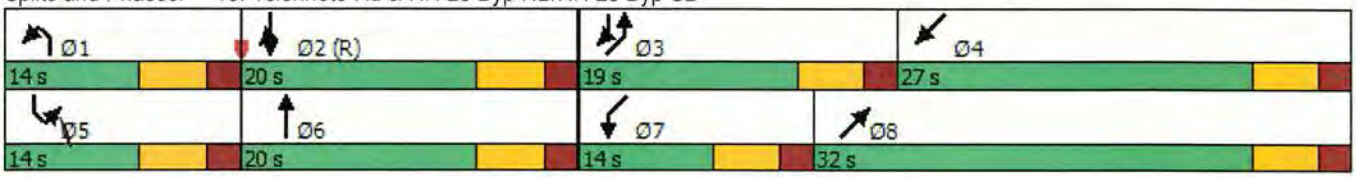
Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.22
Intersection Signal Delay: 79.7 Intersection LOS: E
Intersection Capacity Utilization 80.5% ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: Tsienneto Rd & NH 28 Byp NB/NH 28 Byp SB



APPENDIX O-1: 2040 ALTERNATIVE A INTERSECTION CAPACITY ANALYSES – HCS PRINTOUTS – AM PEAK HOUR

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1340	825	0	375	850
Future Volume (vph)	0	1340	825	0	375	850
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		0.95	0.95		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3406		1930	2682
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3406		1930	2682
Peak-hour factor, PHF	0.93	0.93	0.88	0.88	0.89	0.89
Adj. Flow (vph)	0	1441	938	0	421	955
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1441	938	0	421	955
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		34.0	34.0		29.0	29.0
Effective Green, g (s)		34.0	34.0		29.0	29.0
Actuated g/C Ratio		0.45	0.45		0.39	0.39
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1573	1544		746	1037
v/s Ratio Prot		c0.42	0.28		0.22	c0.36
v/s Ratio Perm						
v/c Ratio		0.92	0.61		0.56	0.92
Uniform Delay, d1		19.2	15.5		18.0	21.9
Progression Factor		1.07	1.41		1.00	1.00
Incremental Delay, d2		3.9	0.2		1.0	12.9
Delay (s)		24.4	22.0		19.0	34.8
Level of Service		C	C		B	C
Approach Delay (s)		24.4	22.0		30.0	
Approach LOS		C	C		C	

Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	490	0	235	0	0	1470	245	0	0	885	175
Future Volume (vph)	490	0	235	0	0	1470	245	0	0	885	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0	6.0			6.0	4.0
Lane Util. Factor	0.97		0.88			0.97	0.95			0.95	1.00
Frt	1.00		0.85			1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)	3242		2632			3335	3438			3505	1568
Flt Permitted	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (perm)	3242		2632			3335	3438			3505	1568
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	557	0	267	0	0	1564	261	0	0	962	190
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	557	0	267	0	0	1564	261	0	0	962	190
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Actuated Green, G (s)	25.0		25.0			67.0	113.0			40.0	150.0
Effective Green, g (s)	25.0		25.0			67.0	113.0			40.0	150.0
Actuated g/C Ratio	0.17		0.17			0.45	0.75			0.27	1.00
Clearance Time (s)	6.0		6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	540		438			1489	2589			934	1568
v/s Ratio Prot	c0.17		0.10			c0.47	0.08			c0.27	
v/s Ratio Perm											0.12
v/c Ratio	1.03		0.61			1.05	0.10			1.03	0.12
Uniform Delay, d1	62.5		58.0			41.5	4.9			55.0	0.0
Progression Factor	1.00		1.00			0.80	1.82			1.00	1.00
Incremental Delay, d2	47.1		2.4			32.0	0.0			37.4	0.2
Delay (s)	109.6		60.4			65.4	9.0			92.4	0.2
Level of Service	F		E			E	A			F	A
Approach Delay (s)		93.6		0.0			57.3			77.2	
Approach LOS		F		A			E			E	

Intersection Summary			
HCM 2000 Control Delay	71.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	96.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	660	455	420	790	0	0	0	0	180	0	445
Future Volume (vph)	0	660	455	420	790	0	0	0	0	180	0	445
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3167	1417	1687	3374					3303		1524
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3167	1417	1687	3374					3303		1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.73	0.73	0.73	0.92	0.92	0.92	0.74	0.74	0.74
Adj. Flow (vph)	0	717	495	575	1082	0	0	0	0	243	0	601
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	72
Lane Group Flow (vph)	0	717	495	575	1082	0	0	0	0	243	0	529
Heavy Vehicles (%)	14%	14%	14%	7%	7%	7%	2%	2%	2%	6%	6%	6%
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Actuated Green, G (s)		31.0	130.0	42.0	79.0					39.0		39.0
Effective Green, g (s)		31.0	130.0	42.0	79.0					39.0		39.0
Actuated g/C Ratio		0.24	1.00	0.32	0.61					0.30		0.30
Clearance Time (s)		6.0		6.0	6.0					6.0		6.0
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Lane Grp Cap (vph)		755	1417	545	2050					990		457
v/s Ratio Prot		c0.23		c0.34	0.32					0.07		c0.35
v/s Ratio Perm			0.35									
v/c Ratio		0.95	0.35	1.06	0.53					0.25		1.16
Uniform Delay, d1		48.7	0.0	44.0	14.7					34.4		45.5
Progression Factor		1.00	1.00	0.39	0.09					1.00		1.00
Incremental Delay, d2		22.5	0.7	49.0	0.4					0.1		92.9
Delay (s)		71.3	0.7	66.0	1.8					34.5		138.4
Level of Service		E	A	E	A					C		F
Approach Delay (s)		42.4			24.1			0.0			108.5	
Approach LOS		D			C			A			F	

Intersection Summary			
HCM 2000 Control Delay	49.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	505	335	0	0	740	630	470	0	180	0	0	0
Future Volume (vph)	505	335	0	0	740	630	470	0	180	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1641	3282			3438	1538	1656		1482			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1641	3282			3438	1538	1656		1482			
Peak-hour factor, PHF	0.87	0.87	0.87	0.90	0.90	0.90	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	580	385	0	0	822	700	603	0	231	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	116	0	0	0
Lane Group Flow (vph)	580	385	0	0	822	700	603	0	115	0	0	0
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	9%	9%	9%	2%	2%	2%
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Actuated Green, G (s)	41.0	76.0			29.0	130.0	42.0		42.0			
Effective Green, g (s)	41.0	76.0			29.0	130.0	42.0		42.0			
Actuated g/C Ratio	0.32	0.58			0.22	1.00	0.32		0.32			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Lane Grp Cap (vph)	517	1918			766	1538	535		478			
v/s Ratio Prot	c0.35	0.12			c0.24		c0.36		0.08			
v/s Ratio Perm						0.46						
v/c Ratio	1.12	0.20			1.07	0.46	1.13		0.24			
Uniform Delay, d1	44.5	12.7			50.5	0.0	44.0		32.3			
Progression Factor	0.14	0.01			1.00	1.00	1.00		1.00			
Incremental Delay, d2	64.7	0.2			53.9	1.0	78.8		0.3			
Delay (s)	70.9	0.3			104.4	1.0	122.8		32.5			
Level of Service	E	A			F	A	F		C			
Approach Delay (s)		42.7			56.9			97.8			0.0	
Approach LOS		D			E			F			A	

Intersection Summary			
HCM 2000 Control Delay	63.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	80	0	25	0	1	0	60	430	0	5	930	20
Future Volume (vph)	80	0	25	0	1	0	60	430	0	5	930	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00		1.00	1.00		1.00	1.00	
Flt Protected		0.95	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1770	1583		1900		1770	3539		1770	3528	
Flt Permitted		0.76	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1407	1583		1900		1770	3539		1770	3528	
Peak-hour factor, PHF	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	0	27	0	4	0	65	467	0	5	1011	22
RTOR Reduction (vph)	0	0	12	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	87	15	0	4	0	65	467	0	5	1032	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	custom		NA		Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Actuated Green, G (s)		7.9	40.1		7.9		6.4	45.7		0.8	40.1	
Effective Green, g (s)		7.9	40.1		7.9		6.4	45.7		0.8	40.1	
Actuated g/C Ratio		0.11	0.55		0.11		0.09	0.63		0.01	0.55	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		153	876		207		156	2233		19	1954	
v/s Ratio Prot					0.00		c0.04	c0.13		0.00	c0.29	
v/s Ratio Perm		c0.06	0.01									
v/c Ratio		0.57	0.02		0.02		0.42	0.21		0.26	0.53	
Uniform Delay, d1		30.6	7.3		28.8		31.2	5.7		35.5	10.2	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.8	0.0		0.0		1.8	0.0		7.3	0.3	
Delay (s)		35.4	7.3		28.8		33.0	5.7		42.8	10.4	
Level of Service		D	A		C		C	A		D	B	
Approach Delay (s)		28.8			28.8			9.1			10.6	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	72.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	70	10	370	0	50	0	370	110	15	495	0
Future Volume (vph)	10	70	10	370	0	50	0	370	110	15	495	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.97			1.00	
Flt Protected		0.99			0.96			1.00			1.00	
Satd. Flow (prot)		1824			1738			1705			1807	
Flt Permitted		0.94			0.68			1.00			0.98	
Satd. Flow (perm)		1716			1243			1705			1772	
Peak-hour factor, PHF	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	17	117	17	385	0	52	0	416	124	17	576	0
RTOR Reduction (vph)	0	5	0	0	22	0	0	12	0	0	0	0
Lane Group Flow (vph)	0	146	0	0	415	0	0	528	0	0	593	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Actuated Green, G (s)		30.7			30.7			33.9			33.9	
Effective Green, g (s)		30.7			30.7			33.9			33.9	
Actuated g/C Ratio		0.40			0.40			0.44			0.44	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		687			498			754			784	
v/s Ratio Prot								0.31				
v/s Ratio Perm		0.08			c0.33						c0.33	
v/c Ratio		0.21			0.83			0.70			0.76	
Uniform Delay, d1		15.0			20.7			17.2			17.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			11.5			2.9			4.2	
Delay (s)		15.2			32.1			20.1			22.1	
Level of Service		B			C			C			C	
Approach Delay (s)		15.2			32.1			20.1			22.1	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	76.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	280	80	20	430	265	170	180	20	90	240	30
Future Volume (vph)	20	280	80	20	430	265	170	180	20	90	240	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.94		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1656	1685		1703	1690		1719	1782		1703	1792	1524
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1656	1685		1703	1690		1719	1782		1703	1792	1524
Peak-hour factor, PHF	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.91	0.91	0.91
Adj. Flow (vph)	21	292	83	21	457	282	200	212	24	99	264	33
RTOR Reduction (vph)	0	8	0	0	17	0	0	4	0	0	0	27
Lane Group Flow (vph)	21	367	0	21	722	0	200	232	0	99	264	6
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	5%	5%	5%	6%	6%	6%
Parking (#/hr)			0									
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases												4
Actuated Green, G (s)	3.1	51.3		1.5	49.7		18.0	29.5		7.1	18.6	21.7
Effective Green, g (s)	3.1	51.3		1.5	49.7		18.0	29.5		7.1	18.6	21.7
Actuated g/C Ratio	0.03	0.45		0.01	0.44		0.16	0.26		0.06	0.16	0.19
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	45	762		22	740		272	463		106	293	372
v/s Ratio Prot	c0.01	0.22		0.01	c0.43		c0.12	0.13		0.06	c0.15	0.00
v/s Ratio Perm												0.00
v/c Ratio	0.47	0.48		0.95	0.98		0.74	0.50		0.93	0.90	0.02
Uniform Delay, d1	54.3	21.7		55.9	31.3		45.4	35.7		52.9	46.5	37.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.5	0.5		169.9	26.9		9.9	0.9		66.1	28.6	0.0
Delay (s)	61.8	22.2		225.8	58.2		55.3	36.6		119.0	75.1	37.2
Level of Service	E	C		F	E		E	D		F	E	D
Approach Delay (s)		24.3			62.8			45.2			82.9	
Approach LOS		C			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	55.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	113.4	Sum of lost time (s)	24.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	240	10	5	240	260	190
Future Volume (vph)	240	10	5	240	260	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.943	
Flt Protected	0.950			0.999		
Satd. Flow (prot)	1719	1538	0	1825	1757	0
Flt Permitted	0.950			0.999		
Satd. Flow (perm)	1719	1538	0	1825	1757	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	322			309	249	
Travel Time (s)	7.3			7.0	5.7	
Peak Hour Factor	0.89	0.89	0.91	0.91	0.93	0.93
Heavy Vehicles (%)	5%	5%	4%	4%	2%	2%
Adj. Flow (vph)	270	11	5	264	280	204
Shared Lane Traffic (%)						
Lane Group Flow (vph)	270	11	0	269	484	0
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	16.9
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	240	10	5	240	260	190
Future Vol, veh/h	240	10	5	240	260	190
Peak Hour Factor	0.89	0.89	0.91	0.91	0.93	0.93
Heavy Vehicles, %	5	5	4	4	2	2
Mvmt Flow	270	11	5	264	280	204
Number of Lanes	1	1	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	2
HCM Control Delay	17.1	13	18.9
HCM LOS	C	B	C

Lane	NBLn1	EBLn1	EBLn2	SBLn1
Vol Left, %	2%	100%	0%	0%
Vol Thru, %	98%	0%	0%	58%
Vol Right, %	0%	0%	100%	42%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	245	240	10	450
LT Vol	5	240	0	0
Through Vol	240	0	0	260
RT Vol	0	0	10	190
Lane Flow Rate	269	270	11	484
Geometry Grp	2	7	7	2
Degree of Util (X)	0.427	0.527	0.018	0.69
Departure Headway (Hd)	5.703	7.036	5.816	5.131
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	630	512	614	702
Service Time	3.758	4.786	3.565	3.18
HCM Lane V/C Ratio	0.427	0.527	0.018	0.689
HCM Control Delay	13	17.4	8.7	18.9
HCM Lane LOS	B	C	A	C
HCM 95th-tile Q	2.1	3	0.1	5.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱	↰	↑↑	↰↰	↱
Traffic Volume (vph)	1090	270	180	1110	280	200
Future Volume (vph)	1090	270	180	1110	280	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.09	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	160	3539	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1185	293	196	1207	304	217
RTOR Reduction (vph)	0	167	0	0	0	17
Lane Group Flow (vph)	1185	126	196	1207	304	200
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov
Protected Phases	4		3	8	2	3
Permitted Phases		4	8			2
Actuated Green, G (s)	42.9	42.9	59.1	59.1	31.9	43.6
Effective Green, g (s)	42.9	42.9	59.1	59.1	31.9	43.6
Actuated g/C Ratio	0.43	0.43	0.59	0.59	0.32	0.44
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1518	679	282	2091	1095	761
v/s Ratio Prot	c0.33		c0.08	0.34	0.09	c0.03
v/s Ratio Perm		0.08	0.33			0.10
v/c Ratio	0.78	0.19	0.70	0.58	0.28	0.26
Uniform Delay, d1	24.5	17.7	21.3	12.7	25.4	18.0
Progression Factor	1.00	1.00	1.00	1.96	1.00	1.00
Incremental Delay, d2	2.7	0.1	5.9	0.3	0.6	0.2
Delay (s)	27.2	17.8	27.2	25.3	26.1	18.1
Level of Service	C	B	C	C	C	B
Approach Delay (s)	25.3			25.5	22.8	
Approach LOS	C			C	C	

Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	60	1200	30	50	1100	10	5	5	40	150	20	40
Future Volume (vph)	60	1200	30	50	1100	10	5	5	40	150	20	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.95			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.98	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00	0.95	1.00	
Satd. Flow (prot)	1687	4830		1719	3434			1779	1583	1805	1710	
Flt Permitted	0.95	1.00		0.95	1.00			0.88	1.00	0.75	1.00	
Satd. Flow (perm)	1687	4830		1719	3434			1608	1583	1419	1710	
Peak-hour factor, PHF	0.89	0.89	0.89	0.96	0.96	0.96	0.65	0.65	0.65	0.67	0.67	0.67
Adj. Flow (vph)	67	1348	34	52	1146	10	8	8	62	224	30	60
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	24	0	48	0
Lane Group Flow (vph)	67	1380	0	52	1156	0	0	16	38	224	42	0
Confl. Peds. (#/hr)							40					
Heavy Vehicles (%)	7%	7%	7%	5%	5%	5%	2%	2%	2%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	1	6		5	2			4	1		8	
Permitted Phases							4		4	8		
Actuated Green, G (s)	8.2	54.1		7.4	53.3			20.5	28.7	20.5	20.5	
Effective Green, g (s)	8.2	54.1		7.4	53.3			20.5	28.7	20.5	20.5	
Actuated g/C Ratio	0.08	0.54		0.07	0.53			0.20	0.29	0.20	0.20	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	138	2613		127	1830			329	549	290	350	
v/s Ratio Prot	c0.04	0.29		0.03	c0.34				0.01		0.02	
v/s Ratio Perm								0.01	0.02	c0.16		
v/c Ratio	0.49	0.53		0.41	0.63			0.05	0.07	0.77	0.12	
Uniform Delay, d1	43.9	14.7		44.2	16.4			31.9	25.9	37.5	32.4	
Progression Factor	1.38	0.49		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.0	0.6		2.1	1.7			0.1	0.1	12.0	0.2	
Delay (s)	62.4	7.8		46.4	18.1			32.0	26.0	49.6	32.6	
Level of Service	E	A		D	B			C	C	D	C	
Approach Delay (s)		10.3			19.3			27.2			44.7	
Approach LOS		B			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	100	70	40	50	100	0	130	820	320	30	935	220
Future Volume (vph)	100	70	40	50	100	0	130	820	320	30	935	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	3471	1553	3335	3438		3400	3505	1568	1752	3505	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1736	3471	1553	3335	3438		3400	3505	1568	1752	3505	1568
Peak-hour factor, PHF	0.84	0.84	0.84	0.79	0.79	0.79	0.86	0.86	0.86	0.99	0.99	0.99
Adj. Flow (vph)	119	83	48	63	127	0	151	953	372	30	944	222
RTOR Reduction (vph)	0	0	35	0	0	0	0	0	0	0	0	73
Lane Group Flow (vph)	119	83	13	63	127	0	151	953	372	30	944	149
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	1	6	7	5	2		3	8		7	4	4 5
Permitted Phases		6	6		2			8	Free		4	
Actuated Green, G (s)	14.2	25.0	30.5	7.0	17.8		10.0	49.5	111.0	5.5	45.0	58.0
Effective Green, g (s)	14.2	25.0	30.5	7.0	17.8		10.0	49.5	111.0	5.5	45.0	58.0
Actuated g/C Ratio	0.13	0.23	0.27	0.06	0.16		0.09	0.45	1.00	0.05	0.41	0.52
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	222	781	510	210	551		306	1563	1568	86	1420	819
v/s Ratio Prot	c0.07	0.02	0.00	0.02	0.04		c0.04	c0.27		0.02	c0.27	0.10
v/s Ratio Perm			0.01						c0.24			
v/c Ratio	0.54	0.11	0.03	0.30	0.23		0.49	0.61	0.24	0.35	0.66	0.18
Uniform Delay, d1	45.3	34.1	29.4	49.7	40.6		48.1	23.4	0.0	51.0	26.9	14.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.43	0.64	0.28
Incremental Delay, d2	2.5	0.3	0.0	0.8	1.0		1.3	0.7	0.4	2.0	1.0	0.1
Delay (s)	47.8	34.4	29.4	50.5	41.6		49.3	24.1	0.4	75.2	18.2	4.1
Level of Service	D	C	C	D	D		D	C	A	E	B	A
Approach Delay (s)		39.8			44.5			20.7			17.0	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	205	60	580	330	50	980
Future Volume (vph)	205	60	580	330	50	980
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	4.0	6.0	6.0
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	3505	1568	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.29	1.00
Satd. Flow (perm)	1770	1583	3505	1568	536	3539
Peak-hour factor, PHF	0.83	0.83	0.86	0.86	0.81	0.81
Adj. Flow (vph)	247	72	674	384	62	1210
RTOR Reduction (vph)	0	44	0	0	0	0
Lane Group Flow (vph)	247	28	674	384	62	1210
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Turn Type	Prot	pm+ov	NA	Free	pm+pt	NA
Protected Phases	1 2 5 6	7	8		7	3 4
Permitted Phases		1 2 5 6		Free	3 4	
Actuated Green, G (s)	38.0	43.5	49.5	111.0	61.0	61.0
Effective Green, g (s)	38.0	43.5	49.5	111.0	61.0	61.0
Actuated g/C Ratio	0.34	0.39	0.45	1.00	0.55	0.55
Clearance Time (s)		6.0	6.0		6.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)	605	705	1563	1568	355	1944
v/s Ratio Prot	c0.14	0.00	0.19		0.01	c0.34
v/s Ratio Perm		0.02		0.24	0.09	
v/c Ratio	0.41	0.04	0.43	0.24	0.17	0.62
Uniform Delay, d1	27.9	20.9	21.1	0.0	12.8	17.1
Progression Factor	1.00	1.00	0.37	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.0	0.2	0.3	0.2	0.6
Delay (s)	28.4	20.9	7.9	0.3	13.0	17.7
Level of Service	C	C	A	A	B	B
Approach Delay (s)	26.7		5.1			17.5
Approach LOS	C		A			B

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	240	0	0	330	10	5	0	5	20	0	180
Future Volume (vph)	20	240	0	0	330	10	5	0	5	20	0	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00			1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00			1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1687	3374			3523			1805	1615		1787	1599
Flt Permitted	0.95	1.00			1.00			0.74	1.00		0.75	1.00
Satd. Flow (perm)	1687	3374			3523			1412	1615		1413	1599
Peak-hour factor, PHF	0.83	0.83	0.83	0.92	0.92	0.92	0.50	0.50	0.50	0.90	0.90	0.90
Adj. Flow (vph)	24	289	0	0	359	11	10	0	10	22	0	200
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	9	0	0	178
Lane Group Flow (vph)	24	289	0	0	368	0	0	10	1	0	22	22
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases					6		8	8	8	4		4
Actuated Green, G (s)	1.5	44.9			37.4			7.0	7.0		7.0	7.0
Effective Green, g (s)	1.5	44.9			37.4			7.0	7.0		7.0	7.0
Actuated g/C Ratio	0.02	0.70			0.59			0.11	0.11		0.11	0.11
Clearance Time (s)	6.0	6.0			6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	39	2370			2061			154	176		154	175
v/s Ratio Prot	c0.01	0.09			c0.10							
v/s Ratio Perm								0.01	0.00		c0.02	0.01
v/c Ratio	0.62	0.12			0.18			0.06	0.01		0.14	0.13
Uniform Delay, d1	30.9	3.1			6.1			25.5	25.4		25.7	25.7
Progression Factor	1.00	1.00			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	25.5	0.1			0.0			0.2	0.0		0.4	0.3
Delay (s)	56.4	3.2			6.2			25.7	25.4		26.2	26.0
Level of Service	E	A			A			C	C		C	C
Approach Delay (s)		7.3			6.2			25.5			26.0	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	63.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	200	5	5	330	120	10	5	5	170	5	110
Future Volume (vph)	30	200	5	5	330	120	10	5	5	170	5	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00		1.00	0.96		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	3303	3393		1736	3332		1805	1758		1665	1674	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	3303	3393		1736	3332		1805	1758		1665	1674	1568
Peak-hour factor, PHF	0.83	0.83	0.83	0.97	0.97	0.97	0.67	0.67	0.67	0.90	0.90	0.90
Adj. Flow (vph)	36	241	6	5	340	124	15	7	7	189	6	122
RTOR Reduction (vph)	0	2	0	0	39	0	0	7	0	0	0	80
Lane Group Flow (vph)	36	245	0	5	425	0	15	7	0	98	97	42
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases								3				
Actuated Green, G (s)	5.0	23.9		0.9	19.8		2.1	2.1		9.8	9.8	20.8
Effective Green, g (s)	5.0	23.9		0.9	19.8		2.1	2.1		9.8	9.8	20.8
Actuated g/C Ratio	0.08	0.39		0.01	0.33		0.03	0.03		0.16	0.16	0.34
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	272	1335		25	1086		62	60		268	270	537
v/s Ratio Prot	c0.01	c0.07		0.00	c0.13		c0.01	0.00		c0.06	0.06	0.03
v/s Ratio Perm												
v/c Ratio	0.13	0.18		0.20	0.39		0.24	0.12		0.37	0.36	0.08
Uniform Delay, d1	25.8	12.0		29.5	15.8		28.5	28.4		22.7	22.7	13.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1		3.9	0.2		2.0	0.9		0.8	0.8	0.1
Delay (s)	26.1	12.1		33.5	16.0		30.6	29.3		23.5	23.5	13.5
Level of Service	C	B		C	B		C	C		C	C	B
Approach Delay (s)		13.9			16.2			30.0			19.7	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	60.7	Sum of lost time (s)	24.0
Intersection Capacity Utilization	38.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	50	210	350	10	30	40
Future Vol, veh/h	50	210	350	10	30	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	89	89	83	83
Heavy Vehicles, %	7	7	4	4	6	6
Mvmt Flow	60	250	393	11	36	48

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	404	0	-	0	769	399
Stage 1	-	-	-	-	399	-
Stage 2	-	-	-	-	370	-
Critical Hdwy	4.17	-	-	-	6.46	6.26
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.263	-	-	-	3.554	3.354
Pot Cap-1 Maneuver	1128	-	-	-	364	642
Stage 1	-	-	-	-	669	-
Stage 2	-	-	-	-	690	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1128	-	-	-	345	642
Mov Cap-2 Maneuver	-	-	-	-	345	-
Stage 1	-	-	-	-	634	-
Stage 2	-	-	-	-	690	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	14.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1128	-	-	-	469
HCM Lane V/C Ratio	0.053	-	-	-	0.18
HCM Control Delay (s)	8.4	-	-	-	14.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.6

Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	325	325	20	100	100	40	10	10	150	130	50
Future Volume (vph)	10	325	325	20	100	100	40	10	10	150	130	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	150		0		150			0		0
Storage Lanes		1	0		0		0			0		0
Taper Length (ft)		25			25					25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.932				0.973					0.980	
Flt Protected		0.976				0.980					0.977	
Satd. Flow (prot)	0	1678	0	0	0	1759	0	0	0	0	1700	0
Flt Permitted		0.976				0.980					0.977	
Satd. Flow (perm)	0	1678	0	0	0	1759	0	0	0	0	1700	0
Link Speed (mph)		30				30					30	
Link Distance (ft)		465				456					371	
Travel Time (s)		10.6				10.4					8.4	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.86	0.86	0.86	0.86	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	7%	7%	7%	7%
Adj. Flow (vph)	11	357	357	22	116	116	47	12	13	188	163	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	747	0	0	0	291	0	0	0	0	427	0
Sign Control		Yield				Yield					Yield	

Intersection Summary			
Area Type:	Other		
Control Type: Roundabout			
Intersection Capacity Utilization 112.5%		ICU Level of Service H	
Analysis Period (min) 15			

Lane Group	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR
Lane Configurations		↕					↕	
Traffic Volume (vph)	70	140	120	120	5	30	230	10
Future Volume (vph)	70	140	120	120	5	30	230	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150			150		0
Storage Lanes	0		0			0		0
Taper Length (ft)	25					25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.928					0.995	
Flt Protected		0.992					0.994	
Satd. Flow (prot)	0	1620	0	0	0	0	1756	0
Flt Permitted		0.992					0.994	
Satd. Flow (perm)	0	1620	0	0	0	0	1756	0
Link Speed (mph)		30					30	
Link Distance (ft)		400					528	
Travel Time (s)		9.1					12.0	
Peak Hour Factor	0.60	0.60	0.60	0.60	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	8%	8%	8%	8%	7%	7%	7%	7%
Adj. Flow (vph)	117	233	200	200	6	36	277	12
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	750	0	0	0	0	331	0
Sign Control		Yield					Yield	

Intersection Summary

Intersection	
Intersection Delay, s/veh	50.5
Intersection LOS	F

Approach	WB	NB	SB	NE	SW
Entry Lanes	1	1	1	1	1
Conflicting Circle Lanes	1	1	1	1	1
Adj Approach Flow, veh/h	747	291	427	750	331
Demand Flow Rate, veh/h	770	298	456	810	354
Vehicles Circulating, veh/h	678	815	839	445	1111
Vehicles Exiting, veh/h	435	440	626	850	337
Ped Vol Crossing Leg, #/h	0	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000	1.000
Approach Delay, s/veh	94.0	14.5	29.7	38.2	39.1
Approach LOS	F	B	D	E	E

Lane	Left	Left	Left	Left	Left
Designated Moves	LR	LTR	LTR	LTR	LTR
Assumed Moves	LR	LTR	LTR	LTR	LTR
RT Channelized					
Lane Util	1.000	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
Entry Flow, veh/h	770	298	456	810	354
Cap Entry Lane, veh/h	691	601	586	876	444
Entry HV Adj Factor	0.970	0.975	0.936	0.926	0.933
Flow Entry, veh/h	747	291	427	750	330
Cap Entry, veh/h	670	586	549	812	415
V/C Ratio	1.114	0.496	0.778	0.924	0.797
Control Delay, s/veh	94.0	14.5	29.7	38.2	39.1
LOS	F	B	D	E	E
95th %tile Queue, veh	22	3	7	13	7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	20	260	10	40	50	280	160	10	10	90	20
Future Volume (vph)	10	20	260	10	40	50	280	160	10	10	90	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		30	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.932			0.997			0.978	
Flt Protected		0.984			0.995			0.970			0.996	
Satd. Flow (prot)	0	1731	1495	0	1678	0	0	1784	0	0	1780	0
Flt Permitted		0.984			0.995			0.970			0.996	
Satd. Flow (perm)	0	1731	1495	0	1678	0	0	1784	0	0	1780	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		113			453			475			436	
Travel Time (s)		2.6			10.3			10.8			9.9	
Confl. Peds. (#/hr)			155									
Peak Hour Factor	0.82	0.82	0.82	0.70	0.70	0.70	0.75	0.75	0.75	0.71	0.71	0.71
Heavy Vehicles (%)	8%	8%	8%	5%	5%	5%	3%	3%	3%	4%	4%	4%
Adj. Flow (vph)	12	24	317	14	57	71	373	213	13	14	127	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	317	0	142	0	0	599	0	0	169	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 51.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	24.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↕			↕			↕	
Traffic Vol, veh/h	10	20	260	10	40	50	280	160	10	10	90	20
Future Vol, veh/h	10	20	260	10	40	50	280	160	10	10	90	20
Conflicting Peds, #/hr	0	0	155	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	70	70	70	75	75	75	71	71	71
Heavy Vehicles, %	8	8	8	5	5	5	3	3	3	4	4	4
Mvmt Flow	12	24	317	14	57	71	373	213	13	14	127	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1199	1141	296	1461	1149	220	155	0	0	226	0	0
Stage 1	169	169	-	966	966	-	-	-	-	-	-	-
Stage 2	1030	972	-	495	183	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.15	6.55	6.25	4.13	-	-	4.14	-	-
Critical Hdwy Stg 1	6.18	5.58	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.545	4.045	3.345	2.227	-	-	2.236	-	-
Pot Cap-1 Maneuver	158	196	729	105	196	812	1419	-	-	1331	-	-
Stage 1	819	747	-	302	329	-	-	-	-	-	-	-
Stage 2	275	323	-	551	743	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	75	135	621	29	135	812	1419	-	-	1331	-	-
Mov Cap-2 Maneuver	75	135	-	29	135	-	-	-	-	-	-	-
Stage 1	572	738	-	211	230	-	-	-	-	-	-	-
Stage 2	132	226	-	220	734	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.7	138.9	5.3	0.6
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1419	-	-	107	621	142	1331	-	-
HCM Lane V/C Ratio	0.263	-	-	0.342	0.511	1.006	0.011	-	-
HCM Control Delay (s)	8.4	0	-	55.2	16.7	138.9	7.7	0	-
HCM Lane LOS	A	A	-	F	C	F	A	A	-
HCM 95th %tile Q(veh)	1.1	-	-	1.4	2.9	7.4	0	-	-

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	50	20	10	40	180	150	320	70	60	470	170
Future Volume (vph)	30	50	20	10	40	180	150	320	70	60	470	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1767		1736	1827	1553	1770	3444		1787	3432	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1767		1736	1827	1553	1770	3444		1787	3432	
Peak-hour factor, PHF	0.82	0.82	0.82	0.81	0.81	0.81	0.68	0.68	0.68	0.78	0.78	0.78
Adj. Flow (vph)	37	61	24	12	49	222	221	471	103	77	603	218
RTOR Reduction (vph)	0	18	0	0	0	128	0	24	0	0	49	0
Lane Group Flow (vph)	37	67	0	12	49	94	221	550	0	77	772	0
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	2.8	16.6		1.4	15.2	29.3	8.1	22.4		4.6	18.9	
Effective Green, g (s)	2.8	16.6		1.4	15.2	29.3	8.1	22.4		4.6	18.9	
Actuated g/C Ratio	0.04	0.24		0.02	0.22	0.42	0.12	0.32		0.07	0.27	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	71	425		35	402	659	207	1118		119	940	
v/s Ratio Prot	c0.02	0.04		0.01	0.03	c0.06	c0.12	c0.16		0.04	c0.22	
v/s Ratio Perm												
v/c Ratio	0.52	0.16		0.34	0.12	0.14	1.07	0.49		0.65	0.82	
Uniform Delay, d1	32.4	20.7		33.3	21.6	12.2	30.4	18.7		31.4	23.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.7	0.2		5.8	0.6	0.1	81.6	0.3		11.5	5.8	
Delay (s)	39.2	20.9		39.1	22.2	12.3	112.1	19.1		42.9	29.3	
Level of Service	D	C		D	C	B	F	B		D	C	
Approach Delay (s)		26.4			15.1			44.9			30.5	
Approach LOS		C			B			D			C	

Intersection Summary

HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	69.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	220	0	10	130	240	530
Future Volume (vph)	220	0	10	130	240	530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	4.0	4.0	6.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	0.95		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787		1770	1863	1845	1568
Flt Permitted	0.95		0.53	1.00	1.00	1.00
Satd. Flow (perm)	1787		984	1863	1845	1568
Peak-hour factor, PHF	0.90	0.90	0.87	0.87	0.89	0.89
Adj. Flow (vph)	244	0	11	149	270	596
RTOR Reduction (vph)	0	0	0	0	0	139
Lane Group Flow (vph)	244	0	11	149	270	457
Heavy Vehicles (%)	1%	1%	2%	2%	3%	3%
Turn Type	Prot		pm+pt	NA	NA	custom
Protected Phases	8		1	6 7	2 7	7 8
Permitted Phases			6 7			2
Actuated Green, G (s)	21.2		32.6	31.9	31.9	55.1
Effective Green, g (s)	21.2		28.6	31.9	31.9	55.1
Actuated g/C Ratio	0.30		0.40	0.44	0.44	0.77
Clearance Time (s)	6.0		6.0			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap (vph)	527		399	827	819	1203
v/s Ratio Prot	c0.14		c0.00	0.08	0.15	c0.21
v/s Ratio Perm			0.01			0.09
v/c Ratio	0.46		0.03	0.18	0.33	0.38
Uniform Delay, d1	20.7		13.1	12.1	13.0	2.7
Progression Factor	1.00		1.00	1.00	1.06	1.74
Incremental Delay, d2	0.6		0.0	0.1	0.2	0.2
Delay (s)	21.3		13.2	12.2	13.9	5.0
Level of Service	C		B	B	B	A
Approach Delay (s)	21.3			12.2	7.8	
Approach LOS	C			B	A	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	71.8	Sum of lost time (s)	22.0
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰↰				↰↰	
Traffic Volume (vph)	980	0	0	0	1730	0
Future Volume (vph)	980	0	0	0	1730	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0				6.0	
Lane Util. Factor	0.97				0.97	
Frt	1.00				1.00	
Flt Protected	0.95				0.95	
Satd. Flow (prot)	3433				3433	
Flt Permitted	0.95				0.95	
Satd. Flow (perm)	3433				3433	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1043	0	0	0	1840	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1043	0	0	0	1840	0
Turn Type	Prot				Prot	
Protected Phases	2				4	
Permitted Phases						
Actuated Green, G (s)	28.0				50.0	
Effective Green, g (s)	28.0				50.0	
Actuated g/C Ratio	0.31				0.56	
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	1068				1907	
v/s Ratio Prot	c0.30				c0.54	
v/s Ratio Perm						
v/c Ratio	0.98				0.96	
Uniform Delay, d1	30.7				19.2	
Progression Factor	1.14				1.00	
Incremental Delay, d2	20.6				13.8	
Delay (s)	55.7				33.0	
Level of Service	E				C	
Approach Delay (s)	55.7		0.0			33.0
Approach LOS	E		A			C

Intersection Summary			
HCM 2000 Control Delay	41.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	145.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations										
Traffic Volume (vph)	0	1730	0	0	980	1390	0	0	0	795
Future Volume (vph)	0	1730	0	0	980	1390	0	0	0	795
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0			6.0	6.0
Lane Util. Factor		0.95			0.95	0.88			1.00	0.95
Frt		1.00			1.00	0.85			0.85	0.85
Flt Protected		1.00			1.00	1.00			1.00	1.00
Satd. Flow (prot)		3539			3539	2787			1583	1504
Flt Permitted		1.00			1.00	1.00			1.00	1.00
Satd. Flow (perm)		3539			3539	2787			1583	1504
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1840	0	0	1043	1479	0	0	0	846
RTOR Reduction (vph)	0	0	0	0	0	18	0	0	0	0
Lane Group Flow (vph)	0	1840	0	0	1043	1461	0	0	423	423
Turn Type		NA			NA	Perm			Prot	Prot
Protected Phases		2			2				4	4
Permitted Phases	2					2				
Actuated Green, G (s)		51.0			51.0	51.0			27.0	27.0
Effective Green, g (s)		51.0			51.0	51.0			27.0	27.0
Actuated g/C Ratio		0.57			0.57	0.57			0.30	0.30
Clearance Time (s)		6.0			6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		2005			2005	1579			474	451
v/s Ratio Prot		0.52			0.29				0.27	c0.28
v/s Ratio Perm						c0.52				
v/c Ratio		0.92			0.52	0.93			0.89	0.94
Uniform Delay, d1		17.6			12.0	17.8			30.1	30.7
Progression Factor		0.01			1.00	1.00			1.00	1.00
Incremental Delay, d2		2.7			1.0	10.7			18.7	27.2
Delay (s)		3.0			13.0	28.5			48.8	57.8
Level of Service		A			B	C			D	E
Approach Delay (s)		3.0			22.0		0.0		53.3	
Approach LOS		A			C		A		D	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	131.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	60	10	320	30	10	710
Future Volume (vph)	60	10	320	30	10	710
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0	4.0	6.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1767		1900	1615	1805	1900
Flt Permitted	0.96		1.00	1.00	0.42	1.00
Satd. Flow (perm)	1767		1900	1615	806	1900
Peak-hour factor, PHF	0.87	0.67	0.95	0.84	0.73	0.96
Adj. Flow (vph)	69	15	337	36	14	740
RTOR Reduction (vph)	8	0	0	17	0	0
Lane Group Flow (vph)	76	0	337	19	14	740
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Turn Type	Prot		NA	Perm	custom	NA
Protected Phases	7		6 8		5	2 8
Permitted Phases				6 8	2	
Actuated Green, G (s)	11.6		37.5	37.5	17.0	37.5
Effective Green, g (s)	11.6		37.5	37.5	17.0	37.5
Actuated g/C Ratio	0.16		0.52	0.52	0.24	0.52
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	285		992	843	200	992
v/s Ratio Prot	c0.04		0.18		c0.00	c0.39
v/s Ratio Perm				0.01	0.02	
v/c Ratio	0.27		0.34	0.02	0.07	0.75
Uniform Delay, d1	26.4		10.0	8.3	21.2	13.4
Progression Factor	1.00		0.35	0.07	1.00	1.00
Incremental Delay, d2	0.5		0.2	0.0	0.1	3.1
Delay (s)	26.9		3.7	0.6	21.3	16.5
Level of Service	C		A	A	C	B
Approach Delay (s)	26.9		3.4			16.6
Approach LOS	C		A			B

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	71.8	Sum of lost time (s)	22.0
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	30	30	300	690	20
Future Volume (vph)	5	30	30	300	690	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.888				0.995	
Flt Protected	0.992		0.950			
Satd. Flow (prot)	1674	0	1787	1900	1872	0
Flt Permitted	0.992		0.950			
Satd. Flow (perm)	1674	0	1787	1900	1872	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	332			288	365	
Travel Time (s)	7.5			6.5	8.3	
Peak Hour Factor	0.64	0.77	0.71	0.90	0.75	0.55
Heavy Vehicles (%)	0%	0%	1%	0%	1%	0%
Adj. Flow (vph)	8	39	42	333	920	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	0	42	333	956	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1

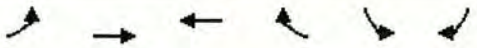
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	30	30	300	690	20
Future Vol, veh/h	5	30	30	300	690	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	64	77	71	90	75	55
Heavy Vehicles, %	0	0	1	0	1	0
Mvmt Flow	8	39	42	333	920	36

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1355	938	956	0	-	0
Stage 1	938	-	-	-	-	-
Stage 2	417	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	166	323	723	-	-	-
Stage 1	384	-	-	-	-	-
Stage 2	669	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	156	323	723	-	-	-
Mov Cap-2 Maneuver	156	-	-	-	-	-
Stage 1	362	-	-	-	-	-
Stage 2	669	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.8	1.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	723	-	274	-	-
HCM Lane V/C Ratio	0.058	-	0.171	-	-
HCM Control Delay (s)	10.3	-	20.8	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.2	-	0.6	-	-

APPENDIX O-2: 2040 ALTERNATIVE A INTERSECTION CAPACITY ANALYSES – HCS PRINTOUTS – PM PEAK HOUR



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1230	1475	0	385	1195
Future Volume (vph)	0	1230	1475	0	385	1195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		0.95	0.95		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3406		1930	2682
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3406		1930	2682
Peak-hour factor, PHF	0.93	0.93	0.88	0.88	0.89	0.89
Adj. Flow (vph)	0	1323	1676	0	433	1343
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1323	1676	0	433	1343
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		59.0	59.0		59.0	59.0
Effective Green, g (s)		59.0	59.0		59.0	59.0
Actuated g/C Ratio		0.45	0.45		0.45	0.45
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1575	1545		875	1217
v/s Ratio Prot		0.38	c0.49		0.22	c0.50
v/s Ratio Perm						
v/c Ratio		0.84	1.08		0.49	1.10
Uniform Delay, d1		31.3	35.5		25.0	35.5
Progression Factor		0.66	0.12		1.00	1.00
Incremental Delay, d2		3.4	39.5		0.4	59.0
Delay (s)		23.9	43.9		25.4	94.5
Level of Service		C	D		C	F
Approach Delay (s)		23.9	43.9		77.7	
Approach LOS		C	D		E	

Intersection Summary			
HCM 2000 Control Delay	50.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.6%	ICU Level of Service	F
Analysis Period (min)	15		

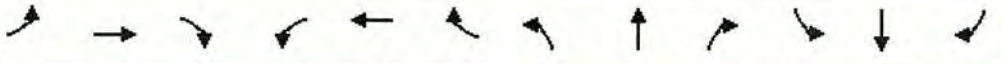
c Critical Lane Group

Movement	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	1360	0	725	0	0	1155	460	0	0	370	110
Future Volume (vph)	1360	0	725	0	0	1155	460	0	0	370	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0	6.0			6.0	4.0
Lane Util. Factor	0.97		0.88			0.97	0.95			0.95	1.00
Frt	1.00		0.85			1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)	3242		2632			3335	3438			3505	1568
Flt Permitted	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (perm)	3242		2632			3335	3438			3505	1568
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	1545	0	824	0	0	1229	489	0	0	402	120
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1545	0	824	0	0	1229	489	0	0	402	120
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Actuated Green, G (s)	48.0		48.0			38.0	70.0			26.0	130.0
Effective Green, g (s)	48.0		48.0			38.0	70.0			26.0	130.0
Actuated g/C Ratio	0.37		0.37			0.29	0.54			0.20	1.00
Clearance Time (s)	6.0		6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	1197		971			974	1851			701	1568
v/s Ratio Prot	c0.48		0.31			c0.37	0.14			c0.11	
v/s Ratio Perm											0.08
v/c Ratio	1.29		0.85			1.26	0.26			0.57	0.08
Uniform Delay, d1	41.0		37.7			46.0	16.1			47.0	0.0
Progression Factor	1.00		1.00			0.76	0.46			1.00	1.00
Incremental Delay, d2	137.2		7.0			123.2	0.2			3.4	0.1
Delay (s)	178.2		44.7			158.2	7.7			50.4	0.1
Level of Service	F		D			F	A			D	A
Approach Delay (s)		131.8		0.0			115.3			38.8	
Approach LOS		F		A			F			D	

Intersection Summary			
HCM 2000 Control Delay	115.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	98.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	755	480	255	665	0	0	0	0	295	0	470
Future Volume (vph)	0	755	480	255	665	0	0	0	0	295	0	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3471	1553	1719	3438					3367		1553
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3471	1553	1719	3438					3367		1553
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	0	868	552	297	773	0	0	0	0	324	0	516
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	137
Lane Group Flow (vph)	0	868	552	297	773	0	0	0	0	324	0	379
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Actuated Green, G (s)		29.1	90.0	18.1	53.2					24.8		24.8
Effective Green, g (s)		29.1	90.0	18.1	53.2					24.8		24.8
Actuated g/C Ratio		0.32	1.00	0.20	0.59					0.28		0.28
Clearance Time (s)		6.0		6.0	6.0					6.0		6.0
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Lane Grp Cap (vph)		1122	1553	345	2032					927		427
v/s Ratio Prot		c0.25		c0.17	0.22					0.10		c0.24
v/s Ratio Perm			0.36									
v/c Ratio		0.77	0.36	0.86	0.38					0.35		0.89
Uniform Delay, d1		27.5	0.0	34.7	9.7					26.1		31.3
Progression Factor		1.00	1.00	0.04	0.00					1.00		1.00
Incremental Delay, d2		5.2	0.6	10.1	0.2					0.2		19.5
Delay (s)		32.7	0.6	11.6	0.2					26.4		50.7
Level of Service		C	A	B	A					C		D
Approach Delay (s)		20.2			3.3			0.0			41.3	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	480	570	0	0	555	445	365	0	420	0	0	0
Future Volume (vph)	480	570	0	0	555	445	365	0	420	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1752	3505			3505	1568	1703		1524			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1752	3505			3505	1568	1703		1524			
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.67	0.67	0.67	0.92	0.92	0.92
Adj. Flow (vph)	522	620	0	0	610	489	545	0	627	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	176	0	0	0
Lane Group Flow (vph)	522	620	0	0	610	489	545	0	451	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	6%	6%	6%	2%	2%	2%
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Actuated Green, G (s)	26.0	50.0			18.0	90.0	28.0		28.0			
Effective Green, g (s)	26.0	50.0			18.0	90.0	28.0		28.0			
Actuated g/C Ratio	0.29	0.56			0.20	1.00	0.31		0.31			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Lane Grp Cap (vph)	506	1947			701	1568	529		474			
v/s Ratio Prot	c0.30	0.18			c0.17		c0.32		0.30			
v/s Ratio Perm						0.31						
v/c Ratio	1.03	0.32			0.87	0.31	1.03		0.95			
Uniform Delay, d1	32.0	10.8			34.9	0.0	31.0		30.3			
Progression Factor	0.10	0.17			1.00	1.00	1.00		1.00			
Incremental Delay, d2	39.7	0.4			13.9	0.5	47.1		29.4			
Delay (s)	42.8	2.2			48.8	0.5	78.1		59.7			
Level of Service	D	A			D	A	E		E			
Approach Delay (s)		20.7			27.3			68.3			0.0	
Approach LOS		C			C			E			A	

Intersection Summary			
HCM 2000 Control Delay	39.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	100	5	90	10	0	10	210	880	120	5	520	140
Future Volume (vph)	100	5	90	10	0	10	210	880	120	5	520	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.93		1.00	0.98		1.00	0.97	
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1778	1583		1729		1770	3476		1770	3427	
Flt Permitted		0.78	1.00		0.78		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1461	1583		1388		1770	3476		1770	3427	
Peak-hour factor, PHF	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	5	98	40	0	40	228	957	130	5	565	152
RTOR Reduction (vph)	0	0	57	0	70	0	0	10	0	0	24	0
Lane Group Flow (vph)	0	114	41	0	10	0	228	1077	0	5	693	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	custom	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Actuated Green, G (s)		9.3	30.8		9.3		14.7	44.7		0.8	30.8	
Effective Green, g (s)		9.3	30.8		9.3		14.7	44.7		0.8	30.8	
Actuated g/C Ratio		0.13	0.42		0.13		0.20	0.61		0.01	0.42	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		186	669		177		357	2134		19	1449	
v/s Ratio Prot							c0.13	c0.31		0.00	0.20	
v/s Ratio Perm		c0.08	0.03		0.01							
v/c Ratio		0.61	0.06		0.06		0.64	0.50		0.26	0.48	
Uniform Delay, d1		30.0	12.4		27.9		26.6	7.9		35.7	15.2	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.9	0.0		0.1		3.7	0.2		7.3	0.3	
Delay (s)		35.9	12.5		28.0		30.3	8.0		43.0	15.4	
Level of Service		D	B		C		C	A		D	B	
Approach Delay (s)		25.1			28.0			11.9			15.6	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	72.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	110	5	270	0	70	0	710	130	15	345	0
Future Volume (vph)	20	110	5	270	0	70	0	710	130	15	345	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.97			0.98			1.00	
Flt Protected		0.99			0.96			1.00			1.00	
Satd. Flow (prot)		1840			1725			1723			1806	
Flt Permitted		0.92			0.58			1.00			0.70	
Satd. Flow (perm)		1706			1046			1723			1268	
Peak-hour factor, PHF	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	33	183	8	281	0	73	0	798	146	17	401	0
RTOR Reduction (vph)	0	1	0	0	25	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	223	0	0	329	0	0	937	0	0	418	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Actuated Green, G (s)		28.0			28.0			50.0			50.0	
Effective Green, g (s)		28.0			28.0			50.0			50.0	
Actuated g/C Ratio		0.31			0.31			0.56			0.56	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		530			325			957			704	
v/s Ratio Prot								c0.54				
v/s Ratio Perm		0.13			c0.31						0.33	
v/c Ratio		0.42			1.01			0.98			0.59	
Uniform Delay, d1		24.6			31.0			19.5			13.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.5			53.2			23.8			1.4	
Delay (s)		25.1			84.2			43.2			14.6	
Level of Service		C			F			D			B	
Approach Delay (s)		25.1			84.2			43.2			14.6	
Approach LOS		C			F			D			B	

Intersection Summary			
HCM 2000 Control Delay	42.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	520	40	60	360	195	170	180	20	80	260	20
Future Volume (vph)	20	520	40	60	360	195	170	180	20	80	260	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.95		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1656	1724		1703	1698		1719	1782		1703	1792	1524
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1656	1724		1703	1698		1719	1782		1703	1792	1524
Peak-hour factor, PHF	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.91	0.91	0.91
Adj. Flow (vph)	21	542	42	64	383	207	200	212	24	88	286	22
RTOR Reduction (vph)	0	2	0	0	15	0	0	4	0	0	0	17
Lane Group Flow (vph)	21	582	0	64	575	0	200	232	0	88	286	5
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	5%	5%	5%	6%	6%	6%
Parking (#/hr)			0									
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases												4
Actuated Green, G (s)	2.2	42.8		4.1	44.7		17.6	29.1		9.2	20.7	22.9
Effective Green, g (s)	2.2	42.8		4.1	44.7		17.6	29.1		9.2	20.7	22.9
Actuated g/C Ratio	0.02	0.39		0.04	0.41		0.16	0.27		0.08	0.19	0.21
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	33	675		63	695		277	474		143	339	403
v/s Ratio Prot	0.01	0.34		c0.04	c0.34		c0.12	0.13		0.05	c0.16	0.00
v/s Ratio Perm												0.00
v/c Ratio	0.64	0.86		1.02	0.83		0.72	0.49		0.62	0.84	0.01
Uniform Delay, d1	53.1	30.5		52.6	28.8		43.5	33.8		48.3	42.7	34.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	33.9	11.0		117.9	8.0		8.9	0.8		7.6	17.1	0.0
Delay (s)	87.0	41.4		170.5	36.8		52.4	34.6		55.9	59.8	34.2
Level of Service	F	D		F	D		D	C		E	E	C
Approach Delay (s)		43.0			49.9			42.8			57.5	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	47.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	109.2	Sum of lost time (s)	24.0
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	560	10	5	555	270	220
Future Volume (vph)	560	10	5	555	270	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.939	
Flt Protected	0.950					
Satd. Flow (prot)	1719	1538	0	1827	1749	0
Flt Permitted	0.950					
Satd. Flow (perm)	1719	1538	0	1827	1749	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	322			309	450	
Travel Time (s)	7.3			7.0	10.2	
Peak Hour Factor	0.89	0.89	0.91	0.91	0.93	0.93
Heavy Vehicles (%)	5%	5%	4%	4%	2%	2%
Adj. Flow (vph)	629	11	5	610	290	237
Shared Lane Traffic (%)						
Lane Group Flow (vph)	629	11	0	615	527	0
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 70.9%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	148.5
Intersection LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	560	10	5	555	270	220
Future Vol, veh/h	560	10	5	555	270	220
Peak Hour Factor	0.89	0.89	0.91	0.91	0.93	0.93
Heavy Vehicles, %	5	5	4	4	2	2
Mvmt Flow	629	11	5	610	290	237
Number of Lanes	1	1	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	2
HCM Control Delay	225	138.3	67.4
HCM LOS	F	F	F

Lane	NBLn1	EBLn1	EBLn2	SBLn1
Vol Left, %	1%	100%	0%	0%
Vol Thru, %	99%	0%	0%	55%
Vol Right, %	0%	0%	100%	45%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	560	560	10	490
LT Vol	5	560	0	0
Through Vol	555	0	0	270
RT Vol	0	0	10	220
Lane Flow Rate	615	629	11	527
Geometry Grp	2	7	7	2
Degree of Util (X)	1.205	1.427	0.022	0.982
Departure Headway (Hd)	8.184	8.587	7.347	8.193
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	449	428	490	448
Service Time	6.184	6.287	5.047	6.193
HCM Lane V/C Ratio	1.37	1.47	0.022	1.176
HCM Control Delay	138.3	228.8	10.2	67.4
HCM Lane LOS	F	F	B	F
HCM 95th-tile Q	20.8	29.9	0.1	12.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱	↰	↑↑	↰↰	↱
Traffic Volume (vph)	1715	265	225	1025	660	460
Future Volume (vph)	1715	265	225	1025	660	460
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1583	1770	3539	3433	1583
Flt Permitted	1.00	1.00	0.06	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	107	3539	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1864	288	245	1114	717	500
RTOR Reduction (vph)	0	96	0	0	0	6
Lane Group Flow (vph)	1864	192	245	1114	717	494
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov
Protected Phases	4		3	8	2	3
Permitted Phases		4	8			2
Actuated Green, G (s)	65.0	65.0	83.5	83.5	27.5	41.5
Effective Green, g (s)	65.0	65.0	83.5	83.5	27.5	41.5
Actuated g/C Ratio	0.54	0.54	0.70	0.70	0.23	0.35
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1916	857	268	2462	786	606
v/s Ratio Prot	c0.53		0.11	0.31	c0.21	c0.09
v/s Ratio Perm		0.12	0.53			0.22
v/c Ratio	0.97	0.22	0.91	0.45	0.91	0.82
Uniform Delay, d1	26.6	14.3	40.9	8.1	45.1	35.8
Progression Factor	1.00	1.00	1.05	1.39	1.00	1.00
Incremental Delay, d2	14.6	0.1	27.6	0.1	16.7	8.3
Delay (s)	41.2	14.5	70.5	11.4	61.8	44.1
Level of Service	D	B	E	B	E	D
Approach Delay (s)	37.7			22.0	54.5	
Approach LOS	D			C	D	

Intersection Summary			
HCM 2000 Control Delay	37.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	70	2075	30	120	960	80	20	10	90	200	30	60
Future Volume (vph)	70	2075	30	120	960	80	20	10	90	200	30	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.95			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.97	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.99			1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	1.00	
Satd. Flow (prot)	1687	4837		1719	3399			1746	1583	1805	1710	
Flt Permitted	0.95	1.00		0.95	1.00			0.77	1.00	0.73	1.00	
Satd. Flow (perm)	1687	4837		1719	3399			1390	1583	1381	1710	
Peak-hour factor, PHF	0.89	0.89	0.89	0.96	0.96	0.96	0.65	0.65	0.65	0.67	0.67	0.67
Adj. Flow (vph)	79	2331	34	125	1000	83	31	15	138	299	45	90
RTOR Reduction (vph)	0	1	0	0	4	0	0	0	31	0	60	0
Lane Group Flow (vph)	79	2364	0	125	1079	0	0	46	107	299	75	0
Confl. Peds. (#/hr)							40					
Heavy Vehicles (%)	7%	7%	7%	5%	5%	5%	2%	2%	2%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	1	6		5	2			4	1		8	
Permitted Phases							4		4	8		
Actuated Green, G (s)	11.0	61.5		14.0	64.5			26.5	37.5	26.5	26.5	
Effective Green, g (s)	11.0	61.5		14.0	64.5			26.5	37.5	26.5	26.5	
Actuated g/C Ratio	0.09	0.51		0.12	0.54			0.22	0.31	0.22	0.22	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	154	2478		200	1826			306	573	304	377	
v/s Ratio Prot	0.05	c0.49		c0.07	c0.32				0.02		0.04	
v/s Ratio Perm								0.03	0.05	c0.22		
v/c Ratio	0.51	0.95		0.62	0.59			0.15	0.19	0.98	0.20	
Uniform Delay, d1	51.9	27.9		50.5	18.8			37.7	30.1	46.5	38.1	
Progression Factor	1.22	0.80		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	4.9		6.0	1.4			0.2	0.2	46.8	0.3	
Delay (s)	64.4	27.3		56.5	20.2			37.9	30.3	93.3	38.4	
Level of Service	E	C		E	C			D	C	F	D	
Approach Delay (s)		28.5			24.0			32.2			76.2	
Approach LOS		C			C			C			E	

Intersection Summary			
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	40	240	40	50	200	0	230	1380	340	45	820	235
Future Volume (vph)	40	240	40	50	200	0	230	1380	340	45	820	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	3471	1553	3335	3438		3400	3505	1568	1752	3505	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1736	3471	1553	3335	3438		3400	3505	1568	1752	3505	1568
Peak-hour factor, PHF	0.84	0.84	0.84	0.79	0.79	0.79	0.86	0.86	0.86	0.99	0.99	0.99
Adj. Flow (vph)	48	286	48	63	253	0	267	1605	395	45	828	237
RTOR Reduction (vph)	0	0	35	0	0	0	0	0	0	0	0	62
Lane Group Flow (vph)	48	286	13	63	253	0	267	1605	395	45	828	175
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	1	6	7	5	2		3	8		7	4	4 5
Permitted Phases		6	6		2			8	Free		4	
Actuated Green, G (s)	9.0	24.0	32.6	5.0	20.0		15.0	57.5	119.1	8.6	51.1	62.1
Effective Green, g (s)	9.0	24.0	32.6	5.0	20.0		15.0	57.5	119.1	8.6	51.1	62.1
Actuated g/C Ratio	0.08	0.20	0.27	0.04	0.17		0.13	0.48	1.00	0.07	0.43	0.52
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	131	699	503	140	577		428	1692	1568	126	1503	817
v/s Ratio Prot	c0.03	c0.08	0.00	0.02	0.07		c0.08	c0.46		0.03	0.24	0.11
v/s Ratio Perm			0.01						c0.25			
v/c Ratio	0.37	0.41	0.03	0.45	0.44		0.62	0.95	0.25	0.36	0.55	0.21
Uniform Delay, d1	52.3	41.4	31.6	55.7	44.5		49.4	29.4	0.0	52.6	25.4	15.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.39	0.72	0.45
Incremental Delay, d2	1.7	1.8	0.0	2.3	2.4		2.8	12.7	0.4	1.4	0.4	0.1
Delay (s)	54.1	43.2	31.7	58.0	46.9		52.2	42.1	0.4	74.8	18.7	7.0
Level of Service	D	D	C	E	D		D	D	A	E	B	A
Approach Delay (s)		43.1			49.1			36.0			18.5	
Approach LOS		D			D			D			B	

Intersection Summary			
HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	119.1	Sum of lost time (s)	24.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	205	90	920	550	80	1010
Future Volume (vph)	205	90	920	550	80	1010
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	4.0	6.0	6.0
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	3505	1568	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.15	1.00
Satd. Flow (perm)	1770	1583	3505	1568	278	3539
Peak-hour factor, PHF	0.83	0.83	0.86	0.86	0.81	0.81
Adj. Flow (vph)	247	108	1070	640	99	1247
RTOR Reduction (vph)	0	33	0	0	0	0
Lane Group Flow (vph)	247	75	1070	640	99	1247
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Turn Type	Prot	pm+ov	NA	Free	pm+pt	NA
Protected Phases	1 2 5 6	7	8		7	3 4
Permitted Phases		1 2 5 6		Free	3 4	
Actuated Green, G (s)	33.0	41.6	57.5	119.1	72.1	72.1
Effective Green, g (s)	33.0	41.6	57.5	119.1	72.1	72.1
Actuated g/C Ratio	0.28	0.35	0.48	1.00	0.61	0.61
Clearance Time (s)		6.0	6.0		6.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)	490	632	1692	1568	276	2142
v/s Ratio Prot	c0.14	0.01	c0.31		0.03	c0.35
v/s Ratio Perm		0.04		c0.41	0.19	
v/c Ratio	0.50	0.12	0.63	0.41	0.36	0.58
Uniform Delay, d1	36.2	26.3	22.9	0.0	13.9	14.3
Progression Factor	1.00	1.00	0.40	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.1	0.7	0.3	0.8	0.4
Delay (s)	37.0	26.4	10.0	0.3	14.7	14.7
Level of Service	D	C	B	A	B	B
Approach Delay (s)	33.8		6.4			14.7
Approach LOS	C		A			B

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	119.1	Sum of lost time (s)	24.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	170	300	5	20	550	40	15	10	15	20	10	170
Future Volume (vph)	170	300	5	20	550	40	15	10	15	20	10	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1687	3366		1770	3504			1845	1615		1821	1599
Flt Permitted	0.95	1.00		0.95	1.00			0.80	1.00		0.77	1.00
Satd. Flow (perm)	1687	3366		1770	3504			1514	1615		1446	1599
Peak-hour factor, PHF	0.83	0.83	0.83	0.92	0.92	0.92	0.50	0.50	0.50	0.90	0.90	0.90
Adj. Flow (vph)	205	361	6	22	598	43	30	20	30	22	11	189
RTOR Reduction (vph)	0	1	0	0	5	0	0	0	27	0	0	168
Lane Group Flow (vph)	205	366	0	22	636	0	0	50	3	0	33	21
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases					6		8	8	8	4		4
Actuated Green, G (s)	8.1	40.5		1.8	34.2			7.6	7.6		7.6	7.6
Effective Green, g (s)	8.1	40.5		1.8	34.2			7.6	7.6		7.6	7.6
Actuated g/C Ratio	0.12	0.60		0.03	0.50			0.11	0.11		0.11	0.11
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	201	2007		46	1764			169	180		161	178
v/s Ratio Prot	c0.12	0.11		0.01	c0.18							
v/s Ratio Perm								c0.03	0.00		0.02	0.01
v/c Ratio	1.02	0.18		0.48	0.36			0.30	0.02		0.20	0.12
Uniform Delay, d1	29.9	6.2		32.6	10.2			27.7	26.8		27.4	27.1
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	68.7	0.2		7.6	0.1			1.0	0.0		0.6	0.3
Delay (s)	98.6	6.4		40.2	10.3			28.7	26.9		28.0	27.4
Level of Service	F	A		D	B			C	C		C	C
Approach Delay (s)		39.5			11.3			28.0			27.5	
Approach LOS		D			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	67.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	330	5	5	430	140	30	10	10	320	5	150
Future Volume (vph)	30	330	5	5	430	140	30	10	10	320	5	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00		1.00	0.96		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	3303	3398		1736	3343		1805	1758		1665	1672	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.95	1.00
Satd. Flow (perm)	3303	3398		1736	3343		1805	1758		1665	1672	1568
Peak-hour factor, PHF	0.83	0.83	0.83	0.97	0.97	0.97	0.67	0.67	0.67	0.90	0.90	0.90
Adj. Flow (vph)	36	398	6	5	443	144	45	15	15	356	6	167
RTOR Reduction (vph)	0	1	0	0	34	0	0	14	0	0	0	108
Lane Group Flow (vph)	36	403	0	5	553	0	45	16	0	182	180	59
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases								3				
Actuated Green, G (s)	6.5	28.3		1.0	22.8		5.7	5.7		13.2	13.2	25.7
Effective Green, g (s)	6.5	28.3		1.0	22.8		5.7	5.7		13.2	13.2	25.7
Actuated g/C Ratio	0.09	0.39		0.01	0.32		0.08	0.08		0.18	0.18	0.36
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	297	1331		24	1055		142	138		304	305	558
v/s Ratio Prot	0.01	c0.12		0.00	c0.17		c0.02	0.01		c0.11	0.11	c0.04
v/s Ratio Perm												
v/c Ratio	0.12	0.30		0.21	0.52		0.32	0.12		0.60	0.59	0.11
Uniform Delay, d1	30.2	15.1		35.2	20.3		31.4	30.9		27.1	27.0	15.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1		4.3	0.5		1.3	0.4		3.2	3.0	0.1
Delay (s)	30.4	15.3		39.5	20.7		32.7	31.3		30.2	30.1	15.6
Level of Service	C	B		D	C		C	C		C	C	B
Approach Delay (s)		16.5			20.9			32.1			25.6	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	24.0
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	10	400	360	60	30	30
Future Volume (vph)	10	400	360	60	30	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.981		0.932	
Flt Protected	0.950				0.976	
Satd. Flow (prot)	1687	1776	1792	0	1630	0
Flt Permitted	0.950				0.976	
Satd. Flow (perm)	1687	1776	1792	0	1630	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		535	210		522	
Travel Time (s)		12.2	4.8		11.9	
Peak Hour Factor	0.84	0.84	0.89	0.89	0.83	0.83
Heavy Vehicles (%)	7%	7%	4%	4%	6%	6%
Adj. Flow (vph)	12	476	404	67	36	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	476	471	0	72	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 32.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	400	360	60	30	30
Future Vol, veh/h	10	400	360	60	30	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	89	89	83	83
Heavy Vehicles, %	7	7	4	4	6	6
Mvmt Flow	12	476	404	67	36	36

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	471	0	-	0	938	438
Stage 1	-	-	-	-	438	-
Stage 2	-	-	-	-	500	-
Critical Hdwy	4.17	-	-	-	6.46	6.26
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.263	-	-	-	3.554	3.354
Pot Cap-1 Maneuver	1065	-	-	-	289	610
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	601	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1065	-	-	-	286	610
Mov Cap-2 Maneuver	-	-	-	-	286	-
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	601	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	16.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1065	-	-	-	389
HCM Lane V/C Ratio	0.011	-	-	-	0.186
HCM Control Delay (s)	8.4	-	-	-	16.4
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.7

Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	265	265	20	90	100	80	10	10	370	160	30
Future Volume (vph)	10	265	265	20	90	100	80	10	10	370	160	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.931				0.957					0.993	
Flt Protected		0.976				0.984					0.968	
Satd. Flow (prot)	0	1709	0	0	0	1754	0	0	0	0	1808	0
Flt Permitted		0.976				0.984					0.968	
Satd. Flow (perm)	0	1709	0	0	0	1754	0	0	0	0	1808	0
Link Speed (mph)		30				30					30	
Link Distance (ft)		449				456					370	
Travel Time (s)		10.2				10.4					8.4	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.87	0.87	0.87	0.87	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%	2%	2%	1%	1%	1%	1%
Adj. Flow (vph)	11	291	291	22	103	115	92	11	11	402	174	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	615	0	0	0	321	0	0	0	0	620	0
Sign Control		Yield				Yield					Yield	

Intersection Summary	
Area Type:	Other
Control Type: Roundabout	
Intersection Capacity Utilization 141.4%	ICU Level of Service H
Analysis Period (min) 15	

Lane Group	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR
Lane Configurations								
Traffic Volume (vph)	50	280	340	90	10	30	160	20
Future Volume (vph)	50	280	340	90	10	30	160	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.924					0.988	
Flt Protected		0.997					0.991	
Satd. Flow (prot)	0	1733	0	0	0	0	1824	0
Flt Permitted		0.997					0.991	
Satd. Flow (perm)	0	1733	0	0	0	0	1824	0
Link Speed (mph)		30					30	
Link Distance (ft)		390					523	
Travel Time (s)		8.9					11.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%	2%	2%
Adj. Flow (vph)	56	311	378	100	11	33	176	22
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	845	0	0	0	0	242	0
Sign Control		Yield					Yield	

Intersection Summary

Intersection	
Intersection Delay, s/veh	63.2
Intersection LOS	F

Approach	WB	NB	SB	NE	SW
Entry Lanes	1	1	1	1	1
Conflicting Circle Lanes	1	1	1	1	1
Adj Approach Flow, veh/h	615	321	620	845	242
Demand Flow Rate, veh/h	621	327	626	854	247
Vehicles Circulating, veh/h	698	1181	635	649	878
Vehicles Exiting, veh/h	810	322	490	612	441
Ped Vol Crossing Leg, #/h	0	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000	1.000
Approach Delay, s/veh	41.9	39.0	32.9	124.2	13.7
Approach LOS	E	E	D	F	B

Lane	Left	Left	Left	Left	Left
Designated Moves	LR	LTR	LTR	LTR	LTR
Assumed Moves	LR	LTR	LTR	LTR	LTR
RT Channelized					
Lane Util	1.000	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
Entry Flow, veh/h	621	327	626	854	247
Cap Entry Lane, veh/h	677	414	722	712	564
Entry HV Adj Factor	0.990	0.981	0.991	0.989	0.981
Flow Entry, veh/h	615	321	620	845	242
Cap Entry, veh/h	670	406	715	704	553
V/C Ratio	0.917	0.790	0.867	1.200	0.438
Control Delay, s/veh	41.9	39.0	32.9	124.2	13.7
LOS	E	E	D	F	B
95th %tile Queue, veh	12	7	10	29	2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	50	580	10	30	20	215	145	10	25	110	10
Future Volume (vph)	10	50	580	10	30	20	215	145	10	25	110	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.956			0.996			0.991	
Flt Protected		0.992			0.992			0.972			0.992	
Satd. Flow (prot)	0	1848	1583	0	1802	0	0	1821	0	0	1849	0
Flt Permitted		0.992			0.992			0.972			0.992	
Satd. Flow (perm)	0	1848	1583	0	1802	0	0	1821	0	0	1849	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		113			453			475			436	
Travel Time (s)		2.6			10.3			10.8			9.9	
Peak Hour Factor	0.88	0.88	0.88	0.82	0.82	0.82	0.93	0.93	0.93	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	11	57	659	12	37	24	231	156	11	27	121	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	68	659	0	73	0	0	398	0	0	159	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 57.0%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	14.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↕			↕			↕	
Traffic Vol, veh/h	10	50	580	10	30	20	215	145	10	25	110	10
Future Vol, veh/h	10	50	580	10	30	20	215	145	10	25	110	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	82	82	82	93	93	93	91	91	91
Heavy Vehicles, %	2	2	2	0	0	0	1	1	1	1	1	1
Mvmt Flow	11	57	659	12	37	24	231	156	11	27	121	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	835	810	127	1163	810	162	132	0	0	167	0	0
Stage 1	181	181	-	624	624	-	-	-	-	-	-	-
Stage 2	654	629	-	539	186	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	287	314	923	173	316	888	1459	-	-	1417	-	-
Stage 1	821	750	-	477	481	-	-	-	-	-	-	-
Stage 2	456	475	-	530	750	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	212	254	923	35	255	888	1459	-	-	1417	-	-
Mov Cap-2 Maneuver	212	254	-	35	255	-	-	-	-	-	-	-
Stage 1	677	734	-	394	397	-	-	-	-	-	-	-
Stage 2	332	392	-	137	734	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.7	55.3	4.6	1.3
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1459	-	-	246	923	141	1417	-	-
HCM Lane V/C Ratio	0.158	-	-	0.277	0.714	0.519	0.019	-	-
HCM Control Delay (s)	7.9	0	-	25.2	18	55.3	7.6	0	-
HCM Lane LOS	A	A	-	D	C	F	A	A	-
HCM 95th %tile Q(veh)	0.6	-	-	1.1	6.3	2.5	0.1	-	-

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	70	30	40	40	140	190	1010	60	20	340	70
Future Volume (vph)	30	70	30	40	40	140	190	1010	60	20	340	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1780		1787	1881	1599	1805	3580		1805	3518	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1780		1787	1881	1599	1805	3580		1805	3518	
Peak-hour factor, PHF	0.99	0.99	0.99	0.95	0.95	0.95	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	30	71	30	42	42	147	213	1135	67	22	366	75
RTOR Reduction (vph)	0	25	0	0	0	91	0	5	0	0	27	0
Lane Group Flow (vph)	30	76	0	42	42	56	213	1197	0	22	414	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases		6			2							
Actuated Green, G (s)	1.7	8.2		1.7	8.2	22.4	8.2	23.2		1.3	16.3	
Effective Green, g (s)	1.7	8.2		1.7	8.2	22.4	8.2	23.2		1.3	16.3	
Actuated g/C Ratio	0.03	0.14		0.03	0.14	0.38	0.14	0.40		0.02	0.28	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	51	249		52	264	613	253	1422		40	981	
v/s Ratio Prot	0.02	c0.04		c0.02	0.02	0.04	c0.12	c0.33		0.01	0.12	
v/s Ratio Perm												
v/c Ratio	0.59	0.31		0.81	0.16	0.09	0.84	0.84		0.55	0.42	
Uniform Delay, d1	28.0	22.5		28.2	22.1	11.5	24.5	15.9		28.3	17.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.1	0.7		58.8	1.3	0.1	21.6	4.7		15.3	0.3	
Delay (s)	44.1	23.2		87.0	23.4	11.6	46.1	20.6		43.6	17.5	
Level of Service	D	C		F	C	B	D	C		D	B	
Approach Delay (s)		28.0			27.4			24.5			18.7	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	58.4	Sum of lost time (s)	24.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	620	0	10	290	180	350
Future Volume (vph)	620	0	10	290	180	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	4.0	4.0	6.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	0.95		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787		1770	1863	1845	1568
Flt Permitted	0.95		0.53	1.00	1.00	1.00
Satd. Flow (perm)	1787		987	1863	1845	1568
Peak-hour factor, PHF	0.90	0.90	0.87	0.87	0.89	0.89
Adj. Flow (vph)	689	0	11	333	202	393
RTOR Reduction (vph)	0	0	0	0	0	78
Lane Group Flow (vph)	689	0	11	333	202	315
Heavy Vehicles (%)	1%	1%	2%	2%	3%	3%
Turn Type	Prot		pm+pt	NA	NA	custom
Protected Phases	8		1	6 7	2 7	7 8
Permitted Phases			6 7			2
Actuated Green, G (s)	40.3		26.6	25.7	25.7	68.0
Effective Green, g (s)	40.3		22.6	25.7	25.7	68.0
Actuated g/C Ratio	0.47		0.27	0.30	0.30	0.80
Clearance Time (s)	6.0		6.0			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap (vph)	848		271	563	558	1255
v/s Ratio Prot	c0.39		c0.00	c0.18	0.11	0.15
v/s Ratio Perm			0.01			0.05
v/c Ratio	0.81		0.04	0.59	0.36	0.25
Uniform Delay, d1	19.1		23.1	25.1	23.2	2.1
Progression Factor	1.00		1.00	1.00	1.12	0.16
Incremental Delay, d2	6.0		0.1	1.7	0.4	0.1
Delay (s)	25.0		23.1	26.8	26.2	0.4
Level of Service	C		C	C	C	A
Approach Delay (s)	25.0			26.7	9.2	
Approach LOS	C			C	A	

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	84.9	Sum of lost time (s)	22.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	875	0	0	0	1545	0
Future Volume (vph)	875	0	0	0	1545	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0				6.0	
Lane Util. Factor	0.97				0.97	
Frt	1.00				1.00	
Flt Protected	0.95				0.95	
Satd. Flow (prot)	3433				3433	
Flt Permitted	0.95				0.95	
Satd. Flow (perm)	3433				3433	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	931	0	0	0	1644	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	931	0	0	0	1644	0
Turn Type	Prot				Prot	
Protected Phases	2				4	
Permitted Phases						
Actuated Green, G (s)	26.0				42.0	
Effective Green, g (s)	26.0				42.0	
Actuated g/C Ratio	0.32				0.52	
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	1115				1802	
v/s Ratio Prot	c0.27				c0.48	
v/s Ratio Perm						
v/c Ratio	0.83				0.91	
Uniform Delay, d1	25.0				17.3	
Progression Factor	1.18				1.00	
Incremental Delay, d2	6.6				7.5	
Delay (s)	36.1				24.8	
Level of Service	D				C	
Approach Delay (s)	36.1		0.0			24.8
Approach LOS	D		A			C

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	131.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations		↑↑			↑↑	↱↱			↰	↱
Traffic Volume (vph)	0	1545	0	0	875	1240	0	0	0	710
Future Volume (vph)	0	1545	0	0	875	1240	0	0	0	710
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0			6.0	6.0
Lane Util. Factor		0.95			0.95	0.88			1.00	0.95
Frt		1.00			1.00	0.85			0.85	0.85
Flt Protected		1.00			1.00	1.00			1.00	1.00
Satd. Flow (prot)		3539			3539	2787			1583	1504
Flt Permitted		1.00			1.00	1.00			1.00	1.00
Satd. Flow (perm)		3539			3539	2787			1583	1504
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1644	0	0	931	1319	0	0	0	755
RTOR Reduction (vph)	0	0	0	0	0	34	0	0	0	0
Lane Group Flow (vph)	0	1644	0	0	931	1285	0	0	378	377
Turn Type		NA			NA	Perm			Prot	Prot
Protected Phases		2			2				4	4
Permitted Phases						2				
Actuated Green, G (s)		43.0			43.0	43.0			25.0	25.0
Effective Green, g (s)		43.0			43.0	43.0			25.0	25.0
Actuated g/C Ratio		0.54			0.54	0.54			0.31	0.31
Clearance Time (s)		6.0			6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		1902			1902	1498			494	470
v/s Ratio Prot		c0.46			0.26				0.24	c0.25
v/s Ratio Perm						0.46				
v/c Ratio		0.86			0.49	0.86			0.77	0.80
Uniform Delay, d1		16.0			11.6	15.9			24.8	25.2
Progression Factor		0.07			1.00	1.00			1.00	1.00
Incremental Delay, d2		2.3			0.9	6.6			10.8	13.5
Delay (s)		3.5			12.5	22.4			35.6	38.7
Level of Service		A			B	C			D	D
Approach Delay (s)		3.5			18.3		0.0		37.2	
Approach LOS		A			B		A		D	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	117.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	60	10	750	160	10	470
Future Volume (vph)	60	10	750	160	10	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0	4.0	6.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1767		1900	1615	1805	1900
Flt Permitted	0.96		1.00	1.00	0.25	1.00
Satd. Flow (perm)	1767		1900	1615	484	1900
Peak-hour factor, PHF	0.87	0.67	0.95	0.84	0.73	0.96
Adj. Flow (vph)	69	15	789	190	14	490
RTOR Reduction (vph)	8	0	0	44	0	0
Lane Group Flow (vph)	76	0	789	146	14	490
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Turn Type	Prot		NA	Perm	custom	NA
Protected Phases	7		6 8		5	2 8
Permitted Phases				6 8	2	
Actuated Green, G (s)	6.0		56.0	56.0	16.6	56.0
Effective Green, g (s)	6.0		56.0	56.0	16.6	56.0
Actuated g/C Ratio	0.07		0.66	0.66	0.20	0.66
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	124		1253	1065	108	1253
v/s Ratio Prot	c0.04		c0.42		c0.00	0.26
v/s Ratio Perm				0.09	0.02	
v/c Ratio	0.61		0.63	0.14	0.13	0.39
Uniform Delay, d1	38.3		8.4	5.4	28.5	6.6
Progression Factor	1.00		0.49	0.68	1.00	1.00
Incremental Delay, d2	8.2		0.7	0.0	0.5	0.2
Delay (s)	46.6		4.8	3.7	29.0	6.8
Level of Service	D		A	A	C	A
Approach Delay (s)	46.6		4.6			7.4
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	84.9	Sum of lost time (s)	22.0
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	10	40	720	470	10
Future Volume (vph)	10	10	40	720	470	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.939				0.996	
Flt Protected	0.973		0.950			
Satd. Flow (prot)	1736	0	1787	1900	1874	0
Flt Permitted	0.973		0.950			
Satd. Flow (perm)	1736	0	1787	1900	1874	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	332			288	365	
Travel Time (s)	7.5			6.5	8.3	
Peak Hour Factor	0.64	0.77	0.71	0.90	0.75	0.55
Heavy Vehicles (%)	0%	0%	1%	0%	1%	0%
Adj. Flow (vph)	16	13	56	800	627	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	29	0	56	800	645	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.9%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	10	40	720	470	10
Future Vol, veh/h	10	10	40	720	470	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	64	77	71	90	75	55
Heavy Vehicles, %	0	0	1	0	1	0
Mvmt Flow	16	13	56	800	627	18

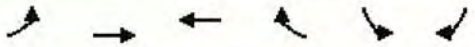
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1548	636	645	0	-	0
Stage 1	636	-	-	-	-	-
Stage 2	912	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	127	481	945	-	-	-
Stage 1	531	-	-	-	-	-
Stage 2	395	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	120	481	945	-	-	-
Mov Cap-2 Maneuver	120	-	-	-	-	-
Stage 1	500	-	-	-	-	-
Stage 2	395	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.4	0.6	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	945	-	182	-	-
HCM Lane V/C Ratio	0.06	-	0.157	-	-
HCM Control Delay (s)	9.1	-	28.4	-	-
HCM Lane LOS	A	-	D	-	-
HCM 95th %tile Q(veh)	0.2	-	0.5	-	-

APPENDIX O-3: 2040 ALTERNATIVE A INTERSECTION CAPACITY ANALYSES – SYNCHRO PRINTOUTS – AM PEAK HOUR

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1340	825	0	375	850
Future Volume (vph)	0	1340	825	0	375	850
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.88
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3471	3406	0	1930	2682
Flt Permitted					0.950	
Satd. Flow (perm)	0	3471	3406	0	1930	2682
Right Turn on Red				Yes		No
Satd. Flow (RTOR)						
Link Speed (mph)		30	30		25	
Link Distance (ft)		712	388		212	
Travel Time (s)		16.2	8.8		5.8	
Peak Hour Factor	0.93	0.93	0.88	0.88	0.89	0.89
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Adj. Flow (vph)	0	1441	938	0	421	955
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1441	938	0	421	955
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		24	24		16	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	0.85	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors		3	3		3	3
Detector Template		Thru	Thru		Left	
Leading Detector (ft)		256	256		256	256
Trailing Detector (ft)		-5	-5		-5	-5
Detector 1 Position(ft)		-5	-5		-5	-5
Detector 1 Size(ft)		50	50		50	50
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		125	125		125	125
Detector 2 Size(ft)		6	6		6	6
Detector 2 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0		0.0	0.0
Detector 3 Position(ft)		250	250		250	250
Detector 3 Size(ft)		6	6		6	6
Detector 3 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 3 Channel						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 3 Extend (s)		0.0	0.0		0.0	0.0
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0		5.0	5.0
Minimum Split (s)		14.0	21.0		27.0	27.0
Total Split (s)		40.0	40.0		35.0	35.0
Total Split (%)		53.3%	53.3%		46.7%	46.7%
Maximum Green (s)		34.0	34.0		29.0	29.0
Yellow Time (s)		2.0	2.0		2.0	2.0
All-Red Time (s)		4.0	4.0		4.0	4.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		14.0	14.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		34.0	34.0		29.0	29.0
Actuated g/C Ratio		0.45	0.45		0.39	0.39
v/c Ratio		0.92	0.61		0.56	0.92
Control Delay		25.0	22.2		21.7	37.9
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		25.0	22.2		21.7	37.9
LOS		C	C		C	D
Approach Delay		25.0	22.2		32.9	
Approach LOS		C	C		C	
Queue Length 50th (ft)		354	397		150	234
Queue Length 95th (ft)		m373	m385		232	#361
Internal Link Dist (ft)		632	308		132	
Turn Bay Length (ft)						
Base Capacity (vph)		1573	1544		746	1037
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.92	0.61		0.56	0.92

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92

Intersection Signal Delay: 27.2 Intersection LOS: C
Intersection Capacity Utilization 69.8% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: NH 102 & Exit 4 SB Off

Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	490	0	235	0	0	1470	245	0	0	885	175
Future Volume (vph)	490	0	235	0	0	1470	245	0	0	885	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0	0	0	550		0	0		0
Storage Lanes		2	2	0	0	2		0	0		1
Taper Length (ft)		25		25		25			25		
Lane Util. Factor	0.97	1.00	0.88	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt			0.850								0.850
Flt Protected	0.950					0.950					
Satd. Flow (prot)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Flt Permitted	0.950					0.950					
Satd. Flow (perm)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Right Turn on Red			No					Yes			Yes
Satd. Flow (RTOR)											109
Link Speed (mph)		25		30			30			30	
Link Distance (ft)		856		390			760			857	
Travel Time (s)		23.3		8.9			17.3			19.5	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Adj. Flow (vph)	557	0	267	0	0	1564	261	0	0	962	190
Shared Lane Traffic (%)											
Lane Group Flow (vph)	557	0	267	0	0	1564	261	0	0	962	190
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		24		0			24			24	
Link Offset(ft)		12		0			0			0	
Crosswalk Width(ft)		16		16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	25	15	9	15		9	15		25
Number of Detectors	3		3			3	3			3	0
Detector Template											
Leading Detector (ft)	256		256			256	256			256	0
Trailing Detector (ft)	-5		-5			-5	-5			-5	0
Detector 1 Position(ft)	-5		-5			-5	-5			-5	-5
Detector 1 Size(ft)	55		55			55	55			55	50
Detector 1 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Queue (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Delay (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 2 Position(ft)	125		125			125	125			125	
Detector 2 Size(ft)	6		6			6	6			6	
Detector 2 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	
Detector 2 Channel											
Detector 2 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Detector 3 Position(ft)	250		250			250	250			250	
Detector 3 Size(ft)	6		6			6	6			6	

Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	CI+Ex		CI+Ex			CI+Ex	CI+Ex			CI+Ex	
Detector 3 Channel											
Detector 3 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Detector Phase	8		2			5	2			6	
Switch Phase											
Minimum Initial (s)	10.0		10.0			5.0	8.0			8.0	
Minimum Split (s)	16.0		16.0			11.0	42.0			31.0	
Total Split (s)	31.0		31.0			73.0	119.0			46.0	
Total Split (%)	20.7%		20.7%			48.7%	79.3%			30.7%	
Maximum Green (s)	25.0		25.0			67.0	113.0			40.0	
Yellow Time (s)	2.0		2.0			2.0	2.0			2.0	
All-Red Time (s)	4.0		4.0			4.0	4.0			4.0	
Lost Time Adjust (s)	0.0		0.0			0.0	0.0			0.0	
Total Lost Time (s)	6.0		6.0			6.0	6.0			6.0	
Lead/Lag						Lead				Lag	
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Recall Mode	None		None			None	C-Min			C-Min	
Walk Time (s)							7.0			7.0	
Flash Dont Walk (s)							29.0			17.0	
Pedestrian Calls (#/hr)							0			0	
Act Effct Green (s)	25.0		25.0			67.0	113.0			40.0	150.0
Actuated g/C Ratio	0.17		0.17			0.45	0.75			0.27	1.00
v/c Ratio	1.03		0.61			1.05	0.10			1.03	0.12
Control Delay	106.8		64.7			65.1	9.1			90.4	0.2
Queue Delay	0.0		0.0			0.0	0.0			0.0	0.0
Total Delay	106.8		64.7			65.1	9.1			90.4	0.2
LOS	F		E			E	A			F	A
Approach Delay		93.1					57.1			75.5	
Approach LOS		F					E			E	
Queue Length 50th (ft)	~300		139			~849	55			~527	0
Queue Length 95th (ft)	#404		190			#980	m63			#665	0
Internal Link Dist (ft)		776		310			680			777	
Turn Bay Length (ft)						550					
Base Capacity (vph)	540		438			1489	2589			934	1568
Starvation Cap Reductn	0		0			0	0			0	0
Spillback Cap Reductn	0		0			0	0			0	0
Storage Cap Reductn	0		0			0	0			0	0
Reduced v/c Ratio	1.03		0.61			1.05	0.10			1.03	0.12

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 67 (45%), Referenced to phase 2:NET and 6:SWT, Start of Yellow
Natural Cycle: 150

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.05
Intersection Signal Delay: 70.5 Intersection LOS: E
Intersection Capacity Utilization 96.4% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: NH 102 & Exit 4 NB Off

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	660	455	420	790	0	0	0	0	180	0	445
Future Volume (vph)	0	660	455	420	790	0	0	0	0	180	0	445
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		350	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3167	1417	1687	3374	0	0	0	0	3303	0	1524
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	3167	1417	1687	3374	0	0	0	0	3303	0	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			495									103
Link Speed (mph)		30			30			30			35	
Link Distance (ft)		851			693			486			581	
Travel Time (s)		19.3			15.8			11.0			11.3	
Peak Hour Factor	0.92	0.92	0.92	0.73	0.73	0.73	0.92	0.92	0.92	0.74	0.74	0.74
Heavy Vehicles (%)	14%	14%	14%	7%	7%	7%	2%	2%	2%	6%	6%	6%
Adj. Flow (vph)	0	717	495	575	1082	0	0	0	0	243	0	601
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	717	495	575	1082	0	0	0	0	243	0	601
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Right
Median Width(ft)		36			36			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		25	15		9	15		9	15		9
Number of Detectors		3	2	3	3					3		2
Detector Template		Thru	Right	Left	Thru					Left		
Leading Detector (ft)		256	131	256	256					256		206
Trailing Detector (ft)		-5	-5	-5	-5					-5		-5
Detector 1 Position(ft)		-5	-5	-5	-5					-5		-5
Detector 1 Size(ft)		50	50	50	50					50		50
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 2 Position(ft)		125	125	125	125					125		200
Detector 2 Size(ft)		6	6	6	6					6		6
Detector 2 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 3 Position(ft)		250		250	250					250		
Detector 3 Size(ft)		6		6	6					6		

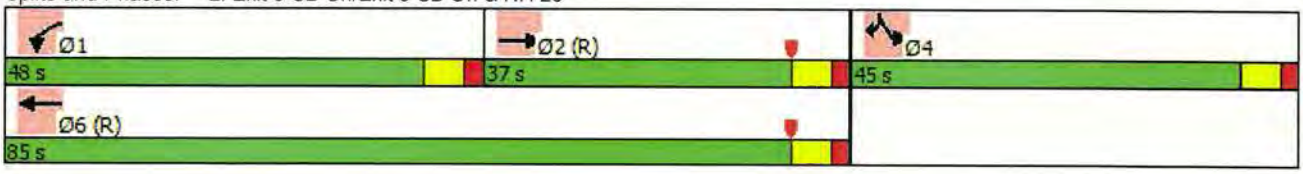
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 3 Type		Cl+Ex		Cl+Ex	Cl+Ex					Cl+Ex		
Detector 3 Channel												
Detector 3 Extend (s)		0.0		0.0	0.0					0.0		
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Detector Phase		2		1	6					4		4
Switch Phase												
Minimum Initial (s)		9.0		4.0	9.0					4.0		4.0
Minimum Split (s)		21.0		10.0	21.0					10.0		10.0
Total Split (s)		37.0		48.0	85.0					45.0		45.0
Total Split (%)		28.5%		36.9%	65.4%					34.6%		34.6%
Maximum Green (s)		31.0		42.0	79.0					39.0		39.0
Yellow Time (s)		4.0		4.0	4.0					4.0		4.0
All-Red Time (s)		2.0		2.0	2.0					2.0		2.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0					6.0		6.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Recall Mode		C-Min		None	C-Min					None		None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		8.0			8.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)		31.0	130.0	42.0	79.0					39.0		39.0
Actuated g/C Ratio		0.24	1.00	0.32	0.61					0.30		0.30
v/c Ratio		0.95	0.35	1.06	0.53					0.25		1.14
Control Delay		71.4	0.7	65.8	1.8					35.2		117.1
Queue Delay		0.0	0.0	0.0	0.4					0.0		0.0
Total Delay		71.4	0.7	65.8	2.2					35.2		117.1
LOS		E	A	E	A					D		F
Approach Delay		42.5			24.3						93.5	
Approach LOS		D			C						F	
Queue Length 50th (ft)		315	0	418	17					79		~526
Queue Length 95th (ft)		#438	0	m150	m14					93		#528
Internal Link Dist (ft)		771			613			406			501	
Turn Bay Length (ft)			350									
Base Capacity (vph)		755	1417	545	2050					990		529
Starvation Cap Reductn		0	0	0	443					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.95	0.35	1.06	0.67					0.25		1.14

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 69 (53%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 130

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 46.0 Intersection LOS: D
Intersection Capacity Utilization 86.0% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Exit 5 SB On/Exit 5 SB Off & NH 28



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	505	335	0	0	740	630	470	0	180	0	0	0
Future Volume (vph)	505	335	0	0	740	630	470	0	180	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1641	3282	0	0	3438	1538	1656	0	1482	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1641	3282	0	0	3438	1538	1656	0	1482	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						492			172			
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		693			542			867			392	
Travel Time (s)		15.8			12.3			16.9			8.9	
Peak Hour Factor	0.87	0.87	0.87	0.90	0.90	0.90	0.78	0.78	0.78	0.92	0.92	0.92
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	9%	9%	9%	2%	2%	2%
Adj. Flow (vph)	580	385	0	0	822	700	603	0	231	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	580	385	0	0	822	700	603	0	231	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Right	Right	Left	Right	Left	Left	Right
Median Width(ft)		36			42			12			12	
Link Offset(ft)		0			0			0			36	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		25	15		9	15		9
Number of Detectors	3	3			3	2	3		0			
Detector Template	Left	Thru			Thru	Right	Left					
Leading Detector (ft)	256	256			256	131	256		0			
Trailing Detector (ft)	-5	-5			-5	-5	-5		0			
Detector 1 Position(ft)	-5	-5			-5	-5	-5		-5			
Detector 1 Size(ft)	50	50			50	50	50		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 2 Position(ft)	125	125			125	125	125					
Detector 2 Size(ft)	6	6			6	6	6					
Detector 2 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex					
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0			0.0	0.0	0.0					
Detector 3 Position(ft)	250	250			250		250					
Detector 3 Size(ft)	6	6			6		6					
Detector 3 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex					
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0			0.0		0.0					

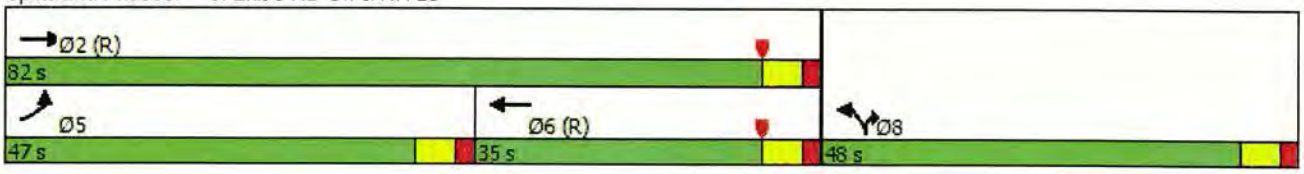
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Detector Phase	5	2			6		8		8			
Switch Phase												
Minimum Initial (s)	4.0	16.0			16.0		4.0		4.0			
Minimum Split (s)	10.0	23.0			23.0		10.0		10.0			
Total Split (s)	47.0	82.0			35.0		48.0		48.0			
Total Split (%)	36.2%	63.1%			26.9%		36.9%		36.9%			
Maximum Green (s)	41.0	76.0			29.0		42.0		42.0			
Yellow Time (s)	4.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	2.0	2.0			2.0		2.0		2.0			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.0		6.0		6.0			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		10.0			10.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	41.0	76.0			29.0	130.0	42.0		42.0			
Actuated g/C Ratio	0.32	0.58			0.22	1.00	0.32		0.32			
v/c Ratio	1.12	0.20			1.07	0.46	1.13		0.39			
Control Delay	76.7	0.3			101.5	1.0	119.5		11.5			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	76.7	0.3			101.5	1.0	119.5		11.5			
LOS	E	A			F	A	F		B			
Approach Delay		46.2			55.3			89.6				
Approach LOS		D			E			F				
Queue Length 50th (ft)	~567	1			~404	0	~587		35			
Queue Length 95th (ft)	m#607	m1			#534	0	#645		69			
Internal Link Dist (ft)		613			462			787			312	
Turn Bay Length (ft)												
Base Capacity (vph)	517	1918			766	1538	535		595			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.12	0.20			1.07	0.46	1.13		0.39			

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.13
Intersection Signal Delay: 61.2 Intersection LOS: E

Intersection Capacity Utilization 86.0% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Exit 5 NB Off & NH 28



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	80	0	25	0	1	0	60	430	0	5	930	20
Future Volume (vph)	80	0	25	0	1	0	60	430	0	5	930	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		225	0		0	350		0	100		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850								0.997	
Flt Protected		0.950					0.950			0.950		
Satd. Flow (prot)	0	1770	1583	0	1900	0	1770	3539	0	1770	3529	0
Flt Permitted		0.755					0.950			0.950		
Satd. Flow (perm)	0	1406	1583	0	1900	0	1770	3539	0	1770	3529	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182								3	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		593			447			750			330	
Travel Time (s)		13.5			10.2			17.0			7.5	
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	87	0	27	0	4	0	65	467	0	5	1011	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	87	27	0	4	0	65	467	0	5	1033	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	3	1	3	1		3	3		3	3	
Detector Template	Left	Thru	Right	Left			Left	Thru		Left	Thru	
Leading Detector (ft)	256	256	45	256	45		256	256		256	256	
Trailing Detector (ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Position(ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	125	125		125			125	125		125	125	
Detector 2 Size(ft)	6	6		6			6	6		6	6	
Detector 2 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Detector 3 Position(ft)	250	250		250			250	250		250	250	
Detector 3 Size(ft)	6	6		6			6	6		6	6	

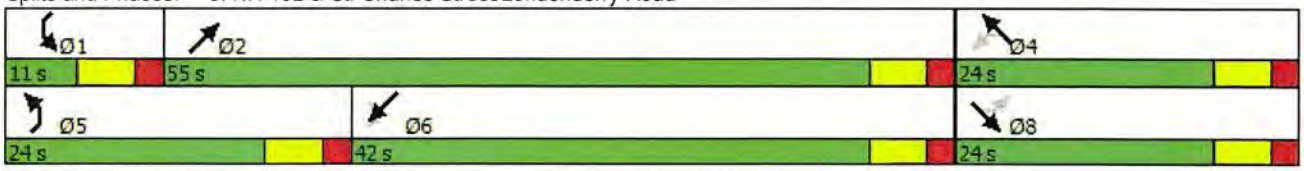
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	custom		NA		Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Detector Phase	8	8	6	4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	8.0	5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		24.0	24.0		11.0	24.0	
Total Split (s)	24.0	24.0	42.0	24.0	24.0		24.0	55.0		11.0	42.0	
Total Split (%)	26.7%	26.7%	46.7%	26.7%	26.7%		26.7%	61.1%		12.2%	46.7%	
Maximum Green (s)	18.0	18.0	36.0	18.0	18.0		18.0	49.0		5.0	36.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lead/Lag			Lag				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	Min	None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0			0	
Act Effct Green (s)		10.0	38.9		9.8		8.3	47.8		5.4	38.9	
Actuated g/C Ratio		0.15	0.59		0.15		0.13	0.72		0.08	0.59	
v/c Ratio		0.41	0.03		0.01		0.29	0.18		0.03	0.50	
Control Delay		35.0	0.0		27.0		33.7	5.7		34.6	13.8	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		35.0	0.0		27.0		33.7	5.7		34.6	13.8	
LOS		D	A		C		C	A		C	B	
Approach Delay		26.8			27.0			9.1			13.9	
Approach LOS		C			C			A			B	
Queue Length 50th (ft)		36	0		2		27	31		2	159	
Queue Length 95th (ft)		80	0		3		66	88		13	265	
Internal Link Dist (ft)		513			367			670			250	
Turn Bay Length (ft)			225				350			100		
Base Capacity (vph)		409	999		554		516	2641		143	2059	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.21	0.03		0.01		0.13	0.18		0.03	0.50	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 66.3
Natural Cycle: 75
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.50
Intersection Signal Delay: 13.3 Intersection LOS: B
Intersection Capacity Utilization 61.8% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 9: NH 102 & St. Charles Street/Londonderry Road



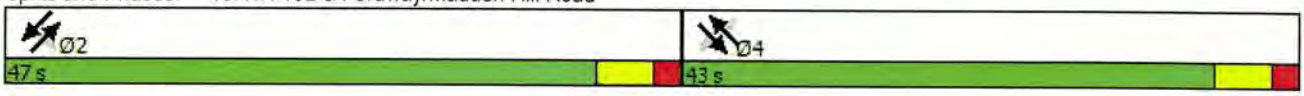
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	70	10	370	0	50	0	370	110	15	495	0
Future Volume (vph)	10	70	10	370	0	50	0	370	110	15	495	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.985			0.984			0.969				
Flt Protected		0.994			0.958						0.999	
Satd. Flow (prot)	0	1824	0	0	1739	0	0	1705	0	0	1808	0
Flt Permitted		0.935			0.685						0.979	
Satd. Flow (perm)	0	1716	0	0	1243	0	0	1705	0	0	1772	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			36			22				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		356			493			1124			603	
Travel Time (s)		8.1			11.2			25.5			13.7	
Peak Hour Factor	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Adj. Flow (vph)	17	117	17	385	0	52	0	416	124	17	576	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	151	0	0	437	0	0	540	0	0	593	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		-22			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	1		3	2			2		3	2	
Detector Template	Left			Left						Left		
Leading Detector (ft)	256	45		256	131			131		256	131	
Trailing Detector (ft)	-5	-5		-5	-5			-5		-5	-5	
Detector 1 Position(ft)	-5	-5		-5	-5			-5		-5	-5	
Detector 1 Size(ft)	50	50		50	50			50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 2 Position(ft)	125			125	125			125		125	125	
Detector 2 Size(ft)	6			6	6			6		6	6	
Detector 2 Type	Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0	0.0			0.0		0.0	0.0	
Detector 3 Position(ft)	250			250						250		
Detector 3 Size(ft)	6			6						6		
Detector 3 Type	Cl+Ex			Cl+Ex						Cl+Ex		
Detector 3 Channel												
Detector 3 Extend (s)	0.0			0.0						0.0		

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Detector Phase	4	4		4	4			2		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0			24.0		24.0	24.0	
Total Split (s)	43.0	43.0		43.0	43.0			47.0		47.0	47.0	
Total Split (%)	47.8%	47.8%		47.8%	47.8%			52.2%		52.2%	52.2%	
Maximum Green (s)	37.0	37.0		37.0	37.0			41.0		41.0	41.0	
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Recall Mode	None	None		None	None			Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		30.7			30.7			33.9			33.9	
Actuated g/C Ratio		0.40			0.40			0.44			0.44	
v/c Ratio		0.22			0.85			0.71			0.76	
Control Delay		16.6			37.8			23.8			26.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		16.6			37.8			23.8			26.8	
LOS		B			D			C			C	
Approach Delay		16.6			37.8			23.8			26.8	
Approach LOS		B			D			C			C	
Queue Length 50th (ft)		50			198			225			266	
Queue Length 95th (ft)		57			#374			339			369	
Internal Link Dist (ft)		276			413			1044			523	
Turn Bay Length (ft)												
Base Capacity (vph)		876			649			969			998	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.17			0.67			0.56			0.59	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 77.3			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 27.8		Intersection LOS: C	
Intersection Capacity Utilization 79.7%		ICU Level of Service D	

Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: NH 102 & Fordway/Madden Hill Road



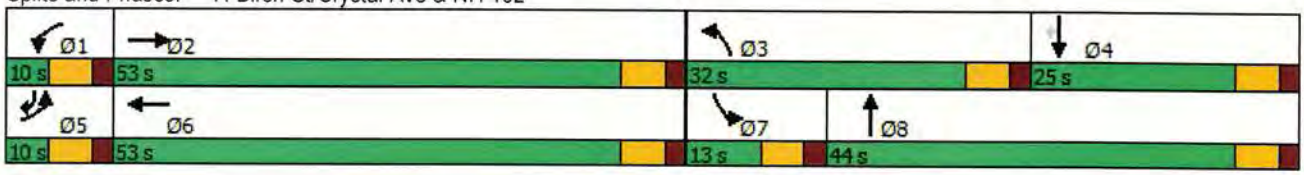
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	280	80	20	430	265	170	180	20	90	240	30
Future Volume (vph)	20	280	80	20	430	265	170	180	20	90	240	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967			0.943			0.985				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1686	0	1703	1690	0	1719	1782	0	1703	1792	1524
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1656	1686	0	1703	1690	0	1719	1782	0	1703	1792	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			30			5				136
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		505			530			361			411	
Travel Time (s)		11.5			12.0			8.2			9.3	
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.91	0.91	0.91
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	5%	5%	5%	6%	6%	6%
Parking (#/hr)			0									
Adj. Flow (vph)	21	292	83	21	457	282	200	212	24	99	264	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	375	0	21	739	0	200	236	0	99	264	33
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases												4
Detector Phase	5	2		1	6		3	8		7	4	5
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	10.0		4.0	10.0		4.0	9.0	4.0
Minimum Split (s)	10.0	30.0		10.0	30.0		10.0	25.0		10.0	25.0	10.0
Total Split (s)	10.0	53.0		10.0	53.0		32.0	44.0		13.0	25.0	10.0
Total Split (%)	8.3%	44.2%		8.3%	44.2%		26.7%	36.7%		10.8%	20.8%	8.3%
Maximum Green (s)	4.0	47.0		4.0	47.0		26.0	38.0		7.0	19.0	4.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Min		None	Min		Min	None		Min	None	None
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		10			10			0			10	
Act Effct Green (s)	4.0	51.4		4.0	47.4		18.0	29.5		7.1	18.6	28.7
Actuated g/C Ratio	0.04	0.47		0.04	0.43		0.16	0.27		0.06	0.17	0.26
v/c Ratio	0.35	0.47		0.34	0.99		0.71	0.49		0.91	0.87	0.07
Control Delay	70.7	23.8		69.8	62.7		58.2	36.9		117.8	74.1	0.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	70.7	23.8		69.8	62.7		58.2	36.9		117.8	74.1	0.3
LOS	E	C		E	E		E	D		F	E	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		26.2			62.9			46.7			78.9	
Approach LOS		C			E			D			E	
Queue Length 50th (ft)	15	158		15	~553		138	140		72	188	0
Queue Length 95th (ft)	#45	315		44	#868		204	202		#194	#367	0
Internal Link Dist (ft)		425			450			281			331	
Turn Bay Length (ft)												
Base Capacity (vph)	60	796		62	746		410	625		109	312	498
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.35	0.47		0.34	0.99		0.49	0.38		0.91	0.85	0.07

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 109.8
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 55.2 Intersection LOS: E
Intersection Capacity Utilization 75.8% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Birch St/Crystal Ave & NH 102



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1090	270	180	1110	280	200
Future Volume (vph)	1090	270	180	1110	280	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	250		0	400
Storage Lanes		1	1		2	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	1770	3539	3433	1583
Flt Permitted			0.086		0.950	
Satd. Flow (perm)	3539	1583	160	3539	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		293				30
Link Speed (mph)	30			30	30	
Link Distance (ft)	511			427	520	
Travel Time (s)	11.6			9.7	11.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1185	293	196	1207	304	217
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1185	293	196	1207	304	217
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov
Protected Phases	4		3	8	2	3
Permitted Phases		4	8			2
Detector Phase	4	4	3	8	2	3
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	29.5	29.5	9.5	29.5	29.5	9.5
Total Split (s)	49.0	49.0	20.3	69.3	30.7	20.3
Total Split (%)	49.0%	49.0%	20.3%	69.3%	30.7%	20.3%
Maximum Green (s)	44.5	44.5	15.8	64.8	26.2	15.8
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?	Yes	Yes	Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	C-Max	None
Walk Time (s)	5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	20.0	20.0		20.0	20.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	42.9	42.9	59.1	59.1	31.9	48.1
Actuated g/C Ratio	0.43	0.43	0.59	0.59	0.32	0.48
v/c Ratio	0.78	0.35	0.70	0.58	0.28	0.28
Control Delay	28.4	3.2	28.7	25.2	27.9	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.4	3.2	28.7	25.2	27.9	15.3

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
LOS	C	A	C	C	C	B
Approach Delay	23.4			25.7	22.6	
Approach LOS	C			C	C	
Queue Length 50th (ft)	315	0	5	388	76	72
Queue Length 95th (ft)	406	46	145	457	119	121
Internal Link Dist (ft)	431			347	440	
Turn Bay Length (ft)			250			400
Base Capacity (vph)	1600	876	349	2293	1095	840
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.33	0.56	0.53	0.28	0.26

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Yellow
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 24.3 — Intersection LOS: C
Intersection Capacity Utilization 59.3% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 9: N. High St & Connector Road

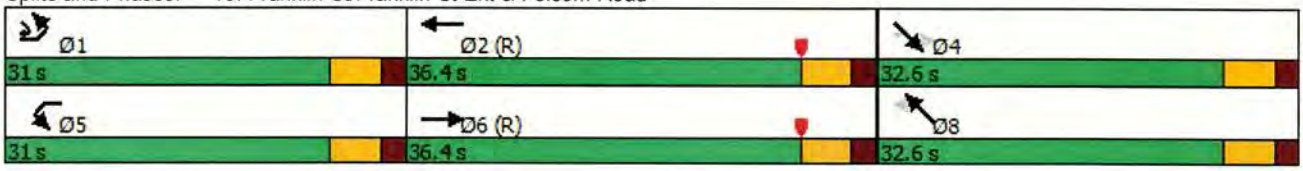
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	60	1200	30	50	1100	10	5	5	40	150	20	40
Future Volume (vph)	60	1200	30	50	1100	10	5	5	40	150	20	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		100	100		0	0		200	100		0
Storage Lanes	1		0	1		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								0.98				
Frt		0.996			0.999				0.850		0.900	
Flt Protected	0.950			0.950				0.976		0.950		
Satd. Flow (prot)	1687	4828	0	1719	3435	0	0	1818	1583	1805	1710	0
Flt Permitted	0.950			0.950				0.882		0.747		
Satd. Flow (perm)	1687	4828	0	1719	3435	0	0	1608	1583	1419	1710	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			1				33		60	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		333			347			309			251	
Travel Time (s)		7.6			7.9			7.0			5.7	
Confl. Peds. (#/hr)							40					
Peak Hour Factor	0.89	0.89	0.89	0.96	0.96	0.96	0.65	0.65	0.65	0.67	0.67	0.67
Heavy Vehicles (%)	7%	7%	7%	5%	5%	5%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	67	1348	34	52	1146	10	8	8	62	224	30	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	1382	0	52	1156	0	0	16	62	224	90	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	1	6		5	2			4	1		8	
Permitted Phases							4		4	8		
Detector Phase	1	6		5	2		4	4	1	8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	31.0	31.0		31.0	31.0		31.0	31.0	31.0	32.5	32.5	
Total Split (s)	31.0	36.4		31.0	36.4		32.6	32.6	31.0	32.6	32.6	
Total Split (%)	31.0%	36.4%		31.0%	36.4%		32.6%	32.6%	31.0%	32.6%	32.6%	
Maximum Green (s)	25.0	30.4		25.0	30.4		26.6	26.6	25.0	26.6	26.6	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag				Lead			
Lead-Lag Optimize?	Yes	Yes		Yes	Yes				Yes			
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)	20.0	20.0		20.0	20.0		20.0	20.0	20.0	20.0	20.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	
Act Effct Green (s)	9.3	55.4		8.5	54.5			20.5	35.8	20.5	20.5	
Actuated g/C Ratio	0.09	0.55		0.08	0.54			0.20	0.36	0.20	0.20	
v/c Ratio	0.43	0.52		0.36	0.62			0.05	0.11	0.77	0.23	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Control Delay	64.2	8.4		49.3	19.9			29.3	10.3	54.8	14.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	64.2	8.4		49.3	19.9			29.3	10.3	54.8	14.0	
LOS	E	A		D	B			C	B	D	B	
Approach Delay		11.0			21.2			14.2			43.1	
Approach LOS		B			C			B			D	
Queue Length 50th (ft)	40	205		32	268			8	12	135	16	
Queue Length 95th (ft)	m55	299		68	415			17	20	141	31	
Internal Link Dist (ft)		253			267			229			171	
Turn Bay Length (ft)	50			100					200	100		
Base Capacity (vph)	421	2674		429	1874			427	831	377	498	
Starvation Cap Reductn	0	0		0	0			0	0	0	0	
Spillback Cap Reductn	0	0		0	0			0	0	0	0	
Storage Cap Reductn	0	0		0	0			0	0	0	0	
Reduced v/c Ratio	0.16	0.52		0.12	0.62			0.04	0.07	0.59	0.18	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 18.4 Intersection LOS: B
Intersection Capacity Utilization 64.9% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Franklin St/Franklin St Ext & Folsom Road



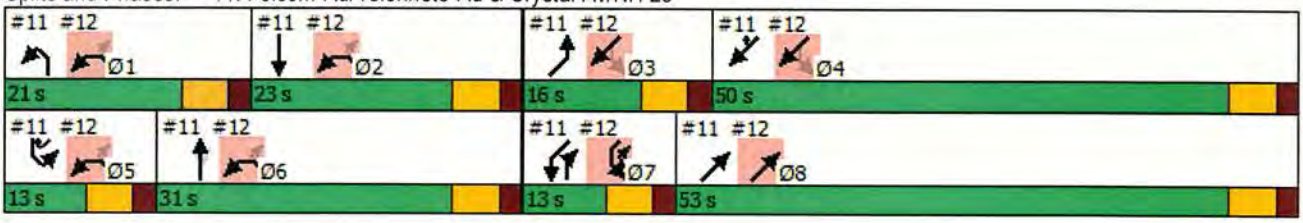
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	100	70	40	50	100	0	130	820	320	30	935	220
Future Volume (vph)	100	70	40	50	100	0	130	820	320	30	935	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	360		400	250		100	0		100
Storage Lanes	1		0	2		0	2		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	3471	1553	3335	3438	0	3400	3505	1568	1752	3505	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	3471	1553	3335	3438	0	3400	3505	1568	1752	3505	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			89						268			152
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		639			1148			921			387	
Travel Time (s)		14.5			26.1			20.9			8.8	
Peak Hour Factor	0.84	0.84	0.84	0.79	0.79	0.79	0.86	0.86	0.86	0.99	0.99	0.99
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	119	83	48	63	127	0	151	953	372	30	944	222
Shared Lane Traffic (%)												
Lane Group Flow (vph)	119	83	48	63	127	0	151	953	372	30	944	222
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	1	6	7	5	2		3	8		7	4	4 5
Permitted Phases		6	6		2			8	Free		4	
Detector Phase	1	6	7	5	2		3	8		7	4	4 5
Switch Phase												
Minimum Initial (s)	8.0	8.0	6.0	7.0	8.0		7.0	8.0		6.0	8.0	
Minimum Split (s)	14.0	40.0	12.0	13.0	31.0		13.0	21.0		12.0	21.0	
Total Split (s)	21.0	31.0	13.0	13.0	23.0		16.0	53.0		13.0	50.0	
Total Split (%)	19.1%	28.2%	11.8%	11.8%	20.9%		14.5%	48.2%		11.8%	45.5%	
Maximum Green (s)	15.0	25.0	7.0	7.0	17.0		10.0	47.0		7.0	44.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max	None	None	Max		None	None		None	None	
Act Effct Green (s)	14.2	25.0	37.7	7.0	17.8		10.0	49.5	109.8	6.7	43.8	56.8
Actuated g/C Ratio	0.13	0.23	0.34	0.06	0.16		0.09	0.45	1.00	0.06	0.40	0.52
v/c Ratio	0.53	0.11	0.08	0.30	0.23		0.49	0.60	0.24	0.28	0.68	0.25
Control Delay	53.8	34.1	1.2	53.0	41.8		53.3	25.5	0.4	76.5	19.8	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.9	0.0
Total Delay	53.8	34.1	1.2	53.0	41.8		53.3	25.5	0.4	76.5	20.7	2.0
LOS	D	C	A	D	D		D	C	A	E	C	A
Approach Delay		37.2			45.5			22.0			18.6	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		D			D			C			B	
Queue Length 50th (ft)	79	24	0	22	42		53	273	0	23	291	5
Queue Length 95th (ft)	129	42	3	39	62		82	321	0	m40	316	11
Internal Link Dist (ft)		559			1068			841			307	
Turn Bay Length (ft)	150		150	360			250		100			100
Base Capacity (vph)	236	789	595	212	558		309	1580	1568	111	1404	871
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	209	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.11	0.08	0.30	0.23		0.49	0.60	0.24	0.27	0.79	0.25

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 109.8
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 23.3 — Intersection LOS: C
Intersection Capacity Utilization 58.9% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Folsom Rd/Tsienneto Rd & Crystal Av/NH 28



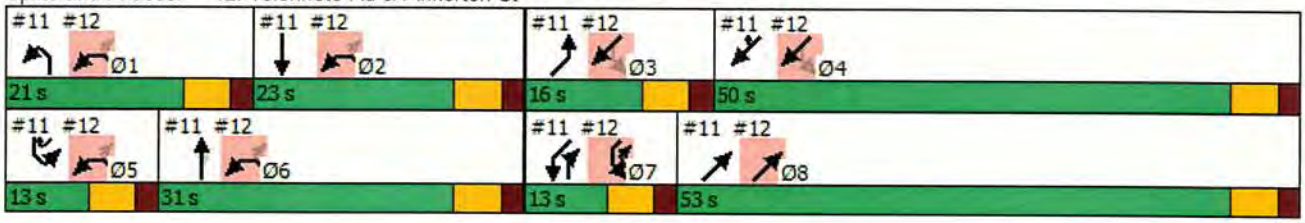
Lane Group	NWL	NWR	NET	NER	SWL	SWT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6
Lane Configurations												
Traffic Volume (vph)	205	60	580	330	50	980						
Future Volume (vph)	205	60	580	330	50	980						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900						
Storage Length (ft)	180	0		0	220							
Storage Lanes	1	1		1	1							
Taper Length (ft)	25				25							
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95						
Frt		0.850		0.850								
Flt Protected	0.950				0.950							
Satd. Flow (prot)	1770	1583	3505	1568	1770	3539						
Flt Permitted	0.950				0.288							
Satd. Flow (perm)	1770	1583	3505	1568	536	3539						
Right Turn on Red		Yes		Yes								
Satd. Flow (RTOR)		72		384								
Link Speed (mph)	30		30			30						
Link Distance (ft)	408		387			376						
Travel Time (s)	9.3		8.8			8.5						
Peak Hour Factor	0.83	0.83	0.86	0.86	0.81	0.81						
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%						
Adj. Flow (vph)	247	72	674	384	62	1210						
Shared Lane Traffic (%)												
Lane Group Flow (vph)	247	72	674	384	62	1210						
Turn Type	Prot	pm+ov	NA	Free	pm+pt	NA						
Protected Phases	1 2 5 6	7	8		7	3 4	1	2	3	4	5	6
Permitted Phases		1 2 5 6		Free	3 4							
Detector Phase	1 2 5 6	7	8		7	3 4						
Switch Phase												
Minimum Initial (s)		6.0	8.0		6.0		8.0	8.0	7.0	8.0	7.0	8.0
Minimum Split (s)		12.0	21.0		12.0		14.0	31.0	13.0	21.0	13.0	40.0
Total Split (s)		13.0	53.0		13.0		21.0	23.0	16.0	50.0	13.0	31.0
Total Split (%)		11.8%	48.2%		11.8%		19%	21%	15%	45%	12%	28%
Maximum Green (s)		7.0	47.0		7.0		15.0	17.0	10.0	44.0	7.0	25.0
Yellow Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		2.0	2.0		2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0							
Total Lost Time (s)		6.0	6.0		6.0							
Lead/Lag		Lead	Lag		Lead		Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?		Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode		None	None		None		None	Max	None	None	None	Max
Act Effct Green (s)	37.6	50.3	49.5	109.8	59.8	59.8						
Actuated g/C Ratio	0.34	0.46	0.45	1.00	0.54	0.54						
v/c Ratio	0.41	0.09	0.43	0.24	0.17	0.63						
Control Delay	29.9	4.2	8.5	0.3	12.9	19.1						
Queue Delay	0.0	0.0	0.2	0.0	0.0	0.1						
Total Delay	29.9	4.2	8.7	0.3	12.9	19.2						
LOS	C	A	A	A	B	B						
Approach Delay	24.1		5.7			18.9						

Lane Group	NWL	NWR	NET	NER	SWL	SWT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6
Approach LOS	C		A			B						
Queue Length 50th (ft)	132	0	42	0	20	295						
Queue Length 95th (ft)	184	21	50	0	36	308						
Internal Link Dist (ft)	328		307			296						
Turn Bay Length (ft)	180				220							
Base Capacity (vph)	612	768	1580	1568	370	1933						
Starvation Cap Reductn	0	0	253	0	0	0						
Spillback Cap Reductn	0	0	0	0	0	97						
Storage Cap Reductn	0	0	0	0	0	0						
Reduced v/c Ratio	0.40	0.09	0.51	0.24	0.17	0.66						

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 109.8
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 14.2 Intersection LOS: B
Intersection Capacity Utilization 48.4% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 12: Tsienneto Rd & Pinkerton St

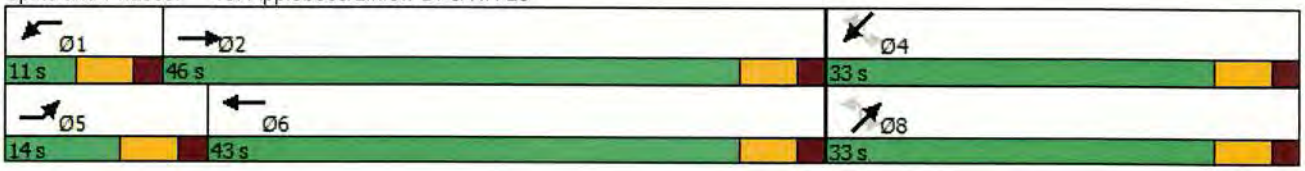


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	240	0	0	330	10	5	0	5	20	0	180
Future Volume (vph)	20	240	0	0	330	10	5	0	5	20	0	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	150		150	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.996				0.850			0.850
Flt Protected	0.950							0.950			0.950	
Satd. Flow (prot)	1687	3374	0	1863	3525	0	0	1805	1615	0	1787	1599
Flt Permitted	0.950							0.743			0.751	
Satd. Flow (perm)	1687	3374	0	1863	3525	0	0	1412	1615	0	1413	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					4				109			200
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		277			1148			218			433	
Travel Time (s)		6.3			26.1			5.0			9.8	
Peak Hour Factor	0.83	0.83	0.83	0.92	0.92	0.92	0.50	0.50	0.50	0.90	0.90	0.90
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	24	289	0	0	359	11	10	0	10	22	0	200
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	289	0	0	370	0	0	10	10	0	22	200
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases					6		8	8	8	4		4
Detector Phase	5	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	46.0		11.0	43.0		33.0	33.0	33.0	33.0	33.0	33.0
Total Split (s)	14.0	46.0		11.0	43.0		33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	15.6%	51.1%		12.2%	47.8%		36.7%	36.7%	36.7%	36.7%	36.7%	36.7%
Maximum Green (s)	8.0	40.0		5.0	37.0		27.0	27.0	27.0	27.0	27.0	27.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max		None	None		None	None	None	None	None	None
Act Effct Green (s)	8.0	40.0			37.4			7.0	7.0		7.0	7.0
Actuated g/C Ratio	0.14	0.68			0.63			0.12	0.12		0.12	0.12
v/c Ratio	0.11	0.13			0.17			0.06	0.03		0.13	0.55
Control Delay	24.5	3.7			6.1			23.4	0.2		24.8	10.5
Queue Delay	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Delay	24.5	3.7			6.1			23.4	0.2		24.8	10.5
LOS	C	A			A			C	A		C	B
Approach Delay		5.3			6.1			11.8			11.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		A			A			B			B	
Queue Length 50th (ft)	8	14			18			3	0		7	0
Queue Length 95th (ft)	25	28			71			8	0		25	49
Internal Link Dist (ft)		197			1068			138			353	
Turn Bay Length (ft)	75											
Base Capacity (vph)	228	2288			2358			646	798		647	840
Starvation Cap Reductn	0	0			0			0	0		0	0
Spillback Cap Reductn	0	0			0			0	0		0	0
Storage Cap Reductn	0	0			0			0	0		0	0
Reduced v/c Ratio	0.11	0.13			0.16			0.02	0.01		0.03	0.24

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 59			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 7.4		Intersection LOS: A	
Intersection Capacity Utilization 39.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 13: Applebees/Linlew Dr & NH 28



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	200	5	5	330	120	10	5	5	170	5	110
Future Volume (vph)	30	200	5	5	330	120	10	5	5	170	5	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	0		0	0		0
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (ft)	200			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.996			0.960			0.925				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.955	
Satd. Flow (prot)	3303	3392	0	1736	3332	0	1805	1758	0	1665	1674	1568
Flt Permitted	0.950			0.950			0.950			0.950	0.955	
Satd. Flow (perm)	3303	3392	0	1736	3332	0	1805	1758	0	1665	1674	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			58			7				122
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		412			486			151			343	
Travel Time (s)		9.4			11.0			3.4			7.8	
Peak Hour Factor	0.83	0.83	0.83	0.97	0.97	0.97	0.67	0.67	0.67	0.90	0.90	0.90
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Adj. Flow (vph)	36	241	6	5	340	124	15	7	7	189	6	122
Shared Lane Traffic (%)										48%		
Lane Group Flow (vph)	36	247	0	5	464	0	15	14	0	98	97	122
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases								3				
Detector Phase	5	2		1	6		3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	5.0		8.0	8.0	
Minimum Split (s)	14.0	53.0		11.0	50.0		22.0	22.0		22.0	22.0	
Total Split (s)	14.0	53.0		13.0	52.0		22.0	22.0		22.0	22.0	
Total Split (%)	12.7%	48.2%		11.8%	47.3%		20.0%	20.0%		20.0%	20.0%	
Maximum Green (s)	8.0	47.0		7.0	46.0		16.0	16.0		16.0	16.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	6.4	23.8		6.0	15.9		6.3	6.3		9.8	9.8	22.5
Actuated g/C Ratio	0.12	0.46		0.12	0.31		0.12	0.12		0.19	0.19	0.43
v/c Ratio	0.09	0.16		0.03	0.44		0.07	0.06		0.31	0.31	0.16
Control Delay	25.8	11.9		27.4	16.8		26.9	21.2		24.6	24.4	4.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	25.8	11.9		27.4	16.8		26.9	21.2		24.6	24.4	4.0
LOS	C	B		C	B		C	C		C	C	A
Approach Delay		13.7			16.9			24.2			16.6	
Approach LOS		B			B			C			B	
Queue Length 50th (ft)	4	14		1	45		4	2		23	23	0
Queue Length 95th (ft)	18	65		12	121		16	13		81	81	30
Internal Link Dist (ft)		332			406			71			263	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	533	2996		245	2929		583	572		537	540	786
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.07	0.08		0.02	0.16		0.03	0.02		0.18	0.18	0.16

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 52.1			
Natural Cycle: 110			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.44			
Intersection Signal Delay: 16.2		Intersection LOS: B	
Intersection Capacity Utilization 38.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 14: VIP Dr/Ashleigh Dr & NH 28

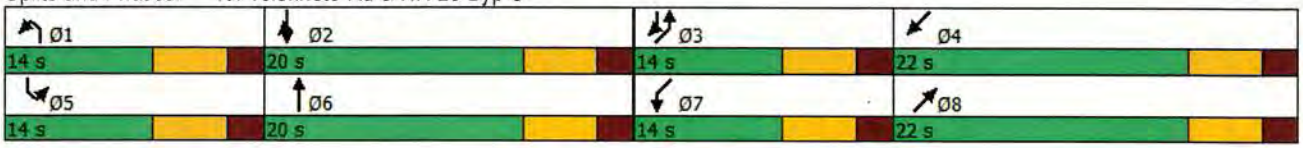
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	50	20	10	40	180	150	320	70	60	470	170
Future Volume (vph)	30	50	20	10	40	180	150	320	70	60	470	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	150		150	150		150
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.958				0.850		0.973			0.960	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1767	0	1736	1827	1553	1770	3444	0	1787	3431	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1767	0	1736	1827	1553	1770	3444	0	1787	3431	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24				222		35			68	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		481			347			479			371	
Travel Time (s)		10.9			7.9			10.9			8.4	
Peak Hour Factor	0.82	0.82	0.82	0.81	0.81	0.81	0.68	0.68	0.68	0.78	0.78	0.78
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	37	61	24	12	49	222	221	471	103	77	603	218
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	85	0	12	49	222	221	574	0	77	821	0
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases												
Detector Phase	1	6		5	2	2 3	3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	20.0		14.0	20.0		14.0	20.0		14.0	20.0	
Total Split (s)	14.0	20.0		14.0	20.0		14.0	22.0		14.0	22.0	
Total Split (%)	20.0%	28.6%		20.0%	28.6%		20.0%	31.4%		20.0%	31.4%	
Maximum Green (s)	8.0	14.0		8.0	14.0		8.0	16.0		8.0	16.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	Max		None	None		None	None	
Act Effct Green (s)	8.1	16.6		8.1	14.2	28.3	8.1	22.4		8.1	16.2	
Actuated g/C Ratio	0.13	0.27		0.13	0.23	0.46	0.13	0.36		0.13	0.26	
v/c Ratio	0.16	0.17		0.05	0.12	0.27	0.95	0.45		0.33	0.86	
Control Delay	28.4	15.5		27.4	22.2	3.2	81.8	19.0		30.9	33.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	28.4	15.5		27.4	22.2	3.2	81.8	19.0		30.9	33.5	
LOS	C	B		C	C	A	F	B		C	C	
Approach Delay		19.4			7.5			36.4			33.3	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		B			A			D			C	
Queue Length 50th (ft)	11	16		4	13	0	74	79		23	121	
Queue Length 95th (ft)	37	51		17	39	27	#154	114		60	#222	
Internal Link Dist (ft)		401			267			399			291	
Turn Bay Length (ft)	150			150		150	150			150		
Base Capacity (vph)	230	494		228	420	834	232	1272		235	951	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.16	0.17		0.05	0.12	0.27	0.95	0.45		0.33	0.86	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 61.6
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 30.2 — Intersection LOS: C
Intersection Capacity Utilization 51.2% — ICU Level of Service A
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: Tsienneto Rd & NH 28 Byp S



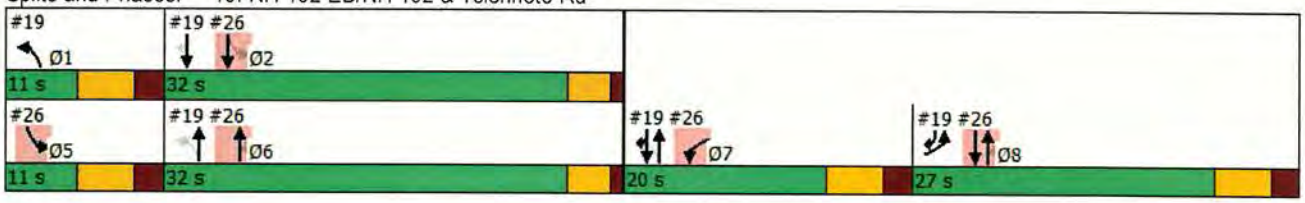
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø2	Ø5	Ø6	Ø7
Lane Configurations										
Traffic Volume (vph)	220	0	10	130	240	530				
Future Volume (vph)	220	0	10	130	240	530				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	200	0	100			90				
Storage Lanes	0	0	1			1				
Taper Length (ft)	25		25							
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Frt						0.850				
Flt Protected	0.950		0.950							
Satd. Flow (prot)	1787	0	1770	1863	1845	1568				
Flt Permitted	0.950		0.528							
Satd. Flow (perm)	1787	0	984	1863	1845	1568				
Right Turn on Red		Yes				Yes				
Satd. Flow (RTOR)						596				
Link Speed (mph)	30			30	30					
Link Distance (ft)	392			704	263					
Travel Time (s)	8.9			16.0	6.0					
Peak Hour Factor	0.90	0.90	0.87	0.87	0.89	0.89				
Heavy Vehicles (%)	1%	1%	2%	2%	3%	3%				
Adj. Flow (vph)	244	0	11	149	270	596				
Shared Lane Traffic (%)										
Lane Group Flow (vph)	244	0	11	149	270	596				
Turn Type	Prot		pm+pt	NA	NA	custom				
Protected Phases	8		1	6 7	2 7	7 8	2	5	6	7
Permitted Phases			6 7			2				
Detector Phase	8		1	6 7	2 7	7 8				
Switch Phase										
Minimum Initial (s)	5.0		5.0				5.0	5.0	5.0	5.0
Minimum Split (s)	26.5		11.0				9.0	11.0	9.0	11.0
Total Split (s)	27.0		11.0				32.0	11.0	32.0	20.0
Total Split (%)	30.0%		12.2%				36%	12%	36%	22%
Maximum Green (s)	21.0		5.0				28.0	5.0	28.0	14.0
Yellow Time (s)	4.0		4.0				3.0	4.0	3.0	4.0
All-Red Time (s)	2.0		2.0				1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0		0.0							
Total Lost Time (s)	6.0		6.0							
Lead/Lag	Lag		Lead				Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes		Yes				Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0		3.0				3.0	3.0	3.0	3.0
Recall Mode	None		None				Min	None	Min	None
Act Effct Green (s)	21.2		32.8	34.1	34.1	64.8				
Actuated g/C Ratio	0.32		0.49	0.51	0.51	0.96				
v/c Ratio	0.43		0.02	0.16	0.29	0.39				
Control Delay	24.7		7.2	9.5	11.1	0.9				
Queue Delay	0.0		0.0	0.0	1.0	0.1				
Total Delay	24.7		7.2	9.5	12.1	1.0				
LOS	C		A	A	B	A				
Approach Delay	24.7			9.3	4.5					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø2	Ø5	Ø6	Ø7
Approach LOS	C			A	A					
Queue Length 50th (ft)	78		2	28	77	0				
Queue Length 95th (ft)	201		8	69	116	19				
Internal Link Dist (ft)	312			624	183					
Turn Bay Length (ft)	200		100			90				
Base Capacity (vph)	577		540	1024	1014	1494				
Starvation Cap Reductn	0		0	0	506	152				
Spillback Cap Reductn	0		0	0	0	0				
Storage Cap Reductn	0		0	0	0	0				
Reduced v/c Ratio	0.42		0.02	0.15	0.53	0.44				

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 67.3
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 9.0 — Intersection LOS: A
Intersection Capacity Utilization 47.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 19: NH 102 EB/NH 102 & Tsienneto Rd



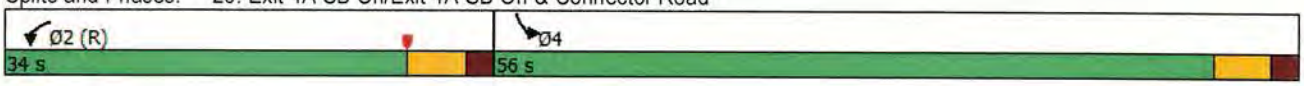
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	⇈				⇈	
Traffic Volume (vph)	980	0	0	0	1730	0
Future Volume (vph)	980	0	0	0	1730	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	1.00	0.97	1.00
Frt						
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3433	0	0	0	3433	0
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3433	0	0	0	3433	0
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (mph)	30		30			30
Link Distance (ft)	372		529			557
Travel Time (s)	8.5		12.0			12.7
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1043	0	0	0	1840	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1043	0	0	0	1840	0
Turn Type	Prot				Prot	
Protected Phases	2				4	
Permitted Phases						
Detector Phase	2				4	
Switch Phase						
Minimum Initial (s)	5.0				9.0	
Minimum Split (s)	24.0				24.0	
Total Split (s)	34.0				56.0	
Total Split (%)	37.8%				62.2%	
Maximum Green (s)	28.0				50.0	
Yellow Time (s)	4.0				4.0	
All-Red Time (s)	2.0				2.0	
Lost Time Adjust (s)	0.0				0.0	
Total Lost Time (s)	6.0				6.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0				3.0	
Recall Mode	C-Max				Max	
Act Effct Green (s)	28.0				50.0	
Actuated g/C Ratio	0.31				0.56	
v/c Ratio	0.98				0.96	
Control Delay	56.5				34.1	
Queue Delay	40.4				0.0	
Total Delay	96.9				34.1	
LOS	F				C	
Approach Delay	96.9					34.1
Approach LOS	F					C
Queue Length 50th (ft)	336				482	
Queue Length 95th (ft)	#456				#679	
Internal Link Dist (ft)	292		449			477

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Bay Length (ft)						
Base Capacity (vph)	1068				1907	
Starvation Cap Reductn	186				0	
Spillback Cap Reductn	0				0	
Storage Cap Reductn	0				0	
Reduced v/c Ratio	1.18				0.96	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 25 (28%), Referenced to phase 2:WBL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 56.8 Intersection LOS: E
Intersection Capacity Utilization 145.8% ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 20: Exit 4A SB On/Exit 4A SB Off & Connector Road



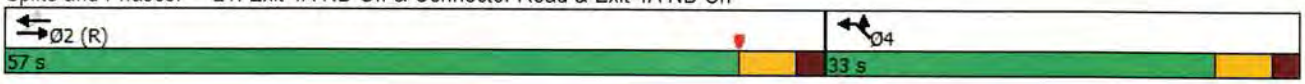
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations										
Traffic Volume (vph)	0	1730	0	0	980	1390	0	0	0	795
Future Volume (vph)	0	1730	0	0	980	1390	0	0	0	795
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		200	0	0	0	0
Storage Lanes	0		0	0		2	0	0	1	1
Taper Length (ft)	25			25			25		25	
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.88	1.00	1.00	1.00	0.95
Frt						0.850			0.850	0.850
Flt Protected										
Satd. Flow (prot)	0	3539	0	0	3539	2787	0	0	1583	1504
Flt Permitted										
Satd. Flow (perm)	0	3539	0	0	3539	2787	0	0	1583	1504
Right Turn on Red			Yes			Yes		Yes		
Satd. Flow (RTOR)						42				
Link Speed (mph)		30			30		30		30	
Link Distance (ft)		372			394		598		519	
Travel Time (s)		8.5			9.0		13.6		11.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1840	0	0	1043	1479	0	0	0	846
Shared Lane Traffic (%)										50%
Lane Group Flow (vph)	0	1840	0	0	1043	1479	0	0	423	423
Turn Type		NA			NA	Perm			Prot	Prot
Protected Phases		2			2				4	4
Permitted Phases	2					2				
Detector Phase	2	2			2	2			4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0			5.0	5.0			9.0	9.0
Minimum Split (s)	24.0	24.0			24.0	24.0			24.0	24.0
Total Split (s)	57.0	57.0			57.0	57.0			33.0	33.0
Total Split (%)	63.3%	63.3%			63.3%	63.3%			36.7%	36.7%
Maximum Green (s)	51.0	51.0			51.0	51.0			27.0	27.0
Yellow Time (s)	4.0	4.0			4.0	4.0			4.0	4.0
All-Red Time (s)	2.0	2.0			2.0	2.0			2.0	2.0
Lost Time Adjust (s)		0.0			0.0	0.0			0.0	0.0
Total Lost Time (s)		6.0			6.0	6.0			6.0	6.0
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0			3.0	3.0			3.0	3.0
Recall Mode	C-Max	C-Max			C-Max	C-Max			Min	Min
Act Effct Green (s)		51.0			51.0	51.0			27.0	27.0
Actuated g/C Ratio		0.57			0.57	0.57			0.30	0.30
v/c Ratio		0.92			0.52	0.93			0.89	0.94
Control Delay		4.2			13.1	29.0			53.6	62.1
Queue Delay		1.1			1.7	0.0			0.0	0.0
Total Delay		5.3			14.8	29.0			53.6	62.1
LOS		A			B	C			D	E
Approach Delay		5.3			23.1				57.8	
Approach LOS		A			C				E	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Queue Length 50th (ft)		0			178	397			229	245
Queue Length 95th (ft)		m0			230	#601			#401	#436
Internal Link Dist (ft)		292			314		518		439	
Turn Bay Length (ft)						200				
Base Capacity (vph)		2005			2005	1597			474	451
Starvation Cap Reductn		53			0	0			0	0
Spillback Cap Reductn		0			742	0			0	0
Storage Cap Reductn		0			0	0			0	0
Reduced v/c Ratio		0.94			0.83	0.93			0.89	0.94

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 22.5 Intersection LOS: C
Intersection Capacity Utilization 131.6% ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 21: Exit 4A NB Off & Connector Road & Exit 4A NB On



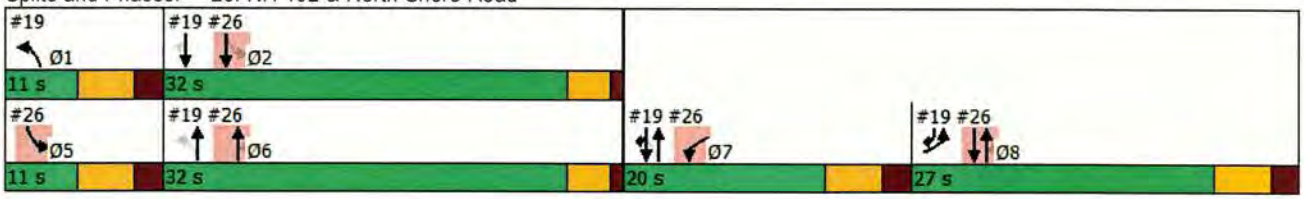
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø1	Ø2	Ø6	Ø8
Lane Configurations										
Traffic Volume (vph)	60	10	320	30	10	710				
Future Volume (vph)	60	10	320	30	10	710				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	0	0		90	100					
Storage Lanes	1	0		1	1					
Taper Length (ft)	25				25					
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Frt	0.976			0.850						
Flt Protected	0.961				0.950					
Satd. Flow (prot)	1768	0	1900	1615	1805	1900				
Flt Permitted	0.961				0.424					
Satd. Flow (perm)	1768	0	1900	1615	806	1900				
Right Turn on Red		Yes		Yes						
Satd. Flow (RTOR)	10			36						
Link Speed (mph)	30		30			30				
Link Distance (ft)	524		263			288				
Travel Time (s)	11.9		6.0			6.5				
Peak Hour Factor	0.87	0.67	0.95	0.84	0.73	0.96				
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%				
Adj. Flow (vph)	69	15	337	36	14	740				
Shared Lane Traffic (%)										
Lane Group Flow (vph)	84	0	337	36	14	740				
Turn Type	Prot		NA	Perm	custom	NA				
Protected Phases	7		6 8		5	2 8	1	2	6	8
Permitted Phases				6 8	2					
Detector Phase	7		6 8	6 8	5	2 8				
Switch Phase										
Minimum Initial (s)	5.0				5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	11.0				11.0		11.0	9.0	9.0	26.5
Total Split (s)	20.0				11.0		11.0	32.0	32.0	27.0
Total Split (%)	22.2%				12.2%		12%	36%	36%	30%
Maximum Green (s)	14.0				5.0		5.0	28.0	28.0	21.0
Yellow Time (s)	4.0				4.0		4.0	3.0	3.0	4.0
All-Red Time (s)	2.0				2.0		2.0	1.0	1.0	2.0
Lost Time Adjust (s)	0.0				0.0					
Total Lost Time (s)	6.0				6.0					
Lead/Lag	Lead				Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes				Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0				3.0		3.0	3.0	3.0	3.0
Recall Mode	None				None		None	Min	Min	None
Act Effct Green (s)	11.6		43.1	43.1	15.0	43.1				
Actuated g/C Ratio	0.17		0.64	0.64	0.22	0.64				
v/c Ratio	0.27		0.28	0.03	0.05	0.61				
Control Delay	26.9		2.3	0.2	18.9	9.3				
Queue Delay	0.0		0.1	0.0	0.0	0.0				
Total Delay	26.9		2.4	0.2	18.9	9.3				
LOS	C		A	A	B	A				
Approach Delay	26.9		2.2			9.5				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø1	Ø2	Ø6	Ø8
Approach LOS	C		A			A				
Queue Length 50th (ft)	25		17	0	5	151				
Queue Length 95th (ft)	77		25	0	13	224				
Internal Link Dist (ft)	444		183			208				
Turn Bay Length (ft)				90	100					
Base Capacity (vph)	388		1550	1324	256	1550				
Starvation Cap Reductn	0		428	0	0	0				
Spillback Cap Reductn	0		0	0	0	0				
Storage Cap Reductn	0		0	0	0	0				
Reduced v/c Ratio	0.22		0.30	0.03	0.05	0.48				

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 67.3
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 8.4 — Intersection LOS: A
Intersection Capacity Utilization 49.9% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 26: NH 102 & North Shore Road



APPENDIX O-4: 2040 ALTERNATIVE A INTERSECTION CAPACITY ANALYSES – SYNCHRO PRINTOUTS – PM PEAK HOUR

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1230	1475	0	385	1195
Future Volume (vph)	0	1230	1475	0	385	1195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.88
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3471	3406	0	1930	2682
Flt Permitted					0.950	
Satd. Flow (perm)	0	3471	3406	0	1930	2682
Right Turn on Red				Yes		No
Satd. Flow (RTOR)						
Link Speed (mph)		30	30		25	
Link Distance (ft)		712	388		212	
Travel Time (s)		16.2	8.8		5.8	
Peak Hour Factor	0.93	0.93	0.88	0.88	0.89	0.89
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Adj. Flow (vph)	0	1323	1676	0	433	1343
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1323	1676	0	433	1343
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		24	24		16	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	0.85	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors		3	3		3	3
Detector Template		Thru	Thru		Left	
Leading Detector (ft)		256	256		256	256
Trailing Detector (ft)		-5	-5		-5	-5
Detector 1 Position(ft)		-5	-5		-5	-5
Detector 1 Size(ft)		50	50		50	50
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		125	125		125	125
Detector 2 Size(ft)		6	6		6	6
Detector 2 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0		0.0	0.0
Detector 3 Position(ft)		250	250		250	250
Detector 3 Size(ft)		6	6		6	6
Detector 3 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 3 Channel						

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 3 Extend (s)		0.0	0.0		0.0	0.0
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0		5.0	5.0
Minimum Split (s)		14.0	21.0		27.0	27.0
Total Split (s)		65.0	65.0		65.0	65.0
Total Split (%)		50.0%	50.0%		50.0%	50.0%
Maximum Green (s)		59.0	59.0		59.0	59.0
Yellow Time (s)		2.0	2.0		2.0	2.0
All-Red Time (s)		4.0	4.0		4.0	4.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		14.0	14.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		59.0	59.0		59.0	59.0
Actuated g/C Ratio		0.45	0.45		0.45	0.45
v/c Ratio		0.84	1.08		0.49	1.10
Control Delay		24.2	48.6		27.4	93.3
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		24.2	48.6		27.4	93.3
LOS		C	D		C	F
Approach Delay		24.2	48.6		77.2	
Approach LOS		C	D		E	
Queue Length 50th (ft)		307	~866		252	~730
Queue Length 95th (ft)		m358	m53		344	#863
Internal Link Dist (ft)		632	308		132	
Turn Bay Length (ft)						
Base Capacity (vph)		1575	1545		875	1217
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.84	1.08		0.49	1.10

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.10

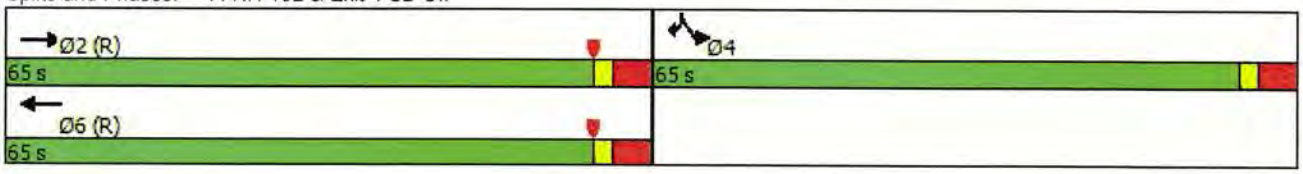
Intersection Signal Delay: 52.5 Intersection LOS: D
Intersection Capacity Utilization 94.6% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: NH 102 & Exit 4 SB Off



Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	1360	0	725	0	0	1155	460	0	0	370	110
Future Volume (vph)	1360	0	725	0	0	1155	460	0	0	370	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0	0	0	550		0	0		0
Storage Lanes		2	2	0	0	2		0	0		1
Taper Length (ft)		25		25		25			25		
Lane Util. Factor	0.97	1.00	0.88	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt			0.850								0.850
Flt Protected	0.950					0.950					
Satd. Flow (prot)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Flt Permitted	0.950					0.950					
Satd. Flow (perm)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Right Turn on Red			No					Yes			Yes
Satd. Flow (RTOR)											126
Link Speed (mph)		25		30			30			30	
Link Distance (ft)		856		390			760			857	
Travel Time (s)		23.3		8.9			17.3			19.5	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Adj. Flow (vph)	1545	0	824	0	0	1229	489	0	0	402	120
Shared Lane Traffic (%)											
Lane Group Flow (vph)	1545	0	824	0	0	1229	489	0	0	402	120
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		24		0			24			24	
Link Offset(ft)		12		0			0			0	
Crosswalk Width(ft)		16		16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	25	15	9	15		9	15		25
Number of Detectors	3		3			3	3			3	0
Detector Template											
Leading Detector (ft)	256		256			256	256			256	0
Trailing Detector (ft)	-5		-5			-5	-5			-5	0
Detector 1 Position(ft)	-5		-5			-5	-5			-5	-5
Detector 1 Size(ft)	55		55			55	55			55	50
Detector 1 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Queue (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Delay (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 2 Position(ft)	125		125			125	125			125	
Detector 2 Size(ft)	6		6			6	6			6	
Detector 2 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	
Detector 2 Channel											
Detector 2 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Detector 3 Position(ft)	250		250			250	250			250	
Detector 3 Size(ft)	6		6			6	6			6	

Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	
Detector 3 Channel											
Detector 3 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Detector Phase	8		2			5	2			6	
Switch Phase											
Minimum Initial (s)	10.0		10.0			5.0	8.0			8.0	
Minimum Split (s)	16.0		16.0			11.0	42.0			31.0	
Total Split (s)	54.0		54.0			44.0	76.0			32.0	
Total Split (%)	41.5%		41.5%			33.8%	58.5%			24.6%	
Maximum Green (s)	48.0		48.0			38.0	70.0			26.0	
Yellow Time (s)	2.0		2.0			2.0	2.0			2.0	
All-Red Time (s)	4.0		4.0			4.0	4.0			4.0	
Lost Time Adjust (s)	0.0		0.0			0.0	0.0			0.0	
Total Lost Time (s)	6.0		6.0			6.0	6.0			6.0	
Lead/Lag						Lead				Lag	
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Recall Mode	None		None			None	C-Min			C-Min	
Walk Time (s)							7.0			7.0	
Flash Dont Walk (s)							29.0			17.0	
Pedestrian Calls (#/hr)							0			0	
Act Effct Green (s)	48.0		48.0			38.0	70.0			26.0	130.0
Actuated g/C Ratio	0.37		0.37			0.29	0.54			0.20	1.00
v/c Ratio	1.29		0.85			1.26	0.26			0.57	0.08
Control Delay	172.3		47.4			155.0	7.7			50.7	0.1
Queue Delay	0.0		0.0			0.0	0.0			0.0	0.0
Total Delay	172.3		47.4			155.0	7.7			50.7	0.1
LOS	F		D			F	A			D	A
Approach Delay		128.8					113.1			39.1	
Approach LOS		F					F			D	
Queue Length 50th (ft)	~854		359			~670	51			162	0
Queue Length 95th (ft)	#957		440			#797	m71			217	0
Internal Link Dist (ft)		776		310			680			777	
Turn Bay Length (ft)						550					
Base Capacity (vph)	1197		971			974	1851			701	1568
Starvation Cap Reductn	0		0			0	0			0	0
Spillback Cap Reductn	0		0			0	0			0	0
Storage Cap Reductn	0		0			0	0			0	0
Reduced v/c Ratio	1.29		0.85			1.26	0.26			0.57	0.08

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 44 (34%), Referenced to phase 2:NET and 6:SWT, Start of Yellow	
Natural Cycle: 150	

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.29
Intersection Signal Delay: 112.8 Intersection LOS: F
Intersection Capacity Utilization 98.0% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: NH 102 & Exit 4 NB Off

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	755	480	255	665	0	0	0	0	295	0	470
Future Volume (vph)	0	755	480	255	665	0	0	0	0	295	0	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		350	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3471	1553	1719	3438	0	0	0	0	3367	0	1553
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	3471	1553	1719	3438	0	0	0	0	3367	0	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			552									189
Link Speed (mph)		30			30			30			35	
Link Distance (ft)		851			693			486			581	
Travel Time (s)		19.3			15.8			11.0			11.3	
Peak Hour Factor	0.87	0.87	0.87	0.86	0.86	0.86	0.92	0.92	0.92	0.91	0.91	0.91
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	0	868	552	297	773	0	0	0	0	324	0	516
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	868	552	297	773	0	0	0	0	324	0	516
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Right	Left	Right
Median Width(ft)		36			36			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		25	15		9	15		9	15		25
Number of Detectors		3	3	3	3					3		3
Detector Template		Thru	Right	Left	Thru					Left		Right
Leading Detector (ft)		256	256	256	256					256		256
Trailing Detector (ft)		-5	-5	-5	-5					-5		-5
Detector 1 Position(ft)		-5	-5	-5	-5					-5		-5
Detector 1 Size(ft)		50	50	50	50					50		50
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 2 Position(ft)		125	125	125	125					125		125
Detector 2 Size(ft)		6	6	6	6					6		6
Detector 2 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 3 Position(ft)		250	250	250	250					250		250
Detector 3 Size(ft)		6	6	6	6					6		6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 3 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 3 Channel												
Detector 3 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Detector Phase		2		1	6					4		4
Switch Phase												
Minimum Initial (s)		9.0		4.0	9.0					4.0		4.0
Minimum Split (s)		21.0		10.0	21.0					10.0		10.0
Total Split (s)		33.0		25.0	58.0					32.0		32.0
Total Split (%)		36.7%		27.8%	64.4%					35.6%		35.6%
Maximum Green (s)		27.0		19.0	52.0					26.0		26.0
Yellow Time (s)		4.0		4.0	4.0					4.0		4.0
All-Red Time (s)		2.0		2.0	2.0					2.0		2.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0					6.0		6.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Recall Mode		C-Min		None	C-Min					None		None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		8.0			8.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)		29.0	90.0	18.1	53.2					24.8		24.8
Actuated g/C Ratio		0.32	1.00	0.20	0.59					0.28		0.28
v/c Ratio		0.78	0.36	0.86	0.38					0.35		0.91
Control Delay		34.2	0.6	16.9	0.2					27.0		42.4
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		34.2	0.6	16.9	0.2					27.0		42.4
LOS		C	A	B	A					C		D
Approach Delay		21.1			4.8						36.4	
Approach LOS		C			A						D	
Queue Length 50th (ft)		241	0	0	0					74		185
Queue Length 95th (ft)		301	0	m0	m0					110		#379
Internal Link Dist (ft)		771			613			406			501	
Turn Bay Length (ft)			350									
Base Capacity (vph)		1120	1553	362	2030					972		583
Starvation Cap Reductn		0	0	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.78	0.36	0.82	0.38					0.33		0.89

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 50 (56%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 80

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 19.7 Intersection LOS: B
Intersection Capacity Utilization 77.2% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Exit 5 SB On/Exit 5 SB Off & NH 28

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	480	570	0	0	555	445	365	0	420	0	0	0
Future Volume (vph)	480	570	0	0	555	445	365	0	420	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1752	3505	0	0	3505	1568	1703	0	1524	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1752	3505	0	0	3505	1568	1703	0	1524	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						489			255			
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		693			542			867			392	
Travel Time (s)		15.8			12.3			16.9			8.9	
Peak Hour Factor	0.92	0.92	0.92	0.91	0.91	0.91	0.67	0.67	0.67	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	6%	6%	6%	2%	2%	2%
Adj. Flow (vph)	522	620	0	0	610	489	545	0	627	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	522	620	0	0	610	489	545	0	627	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Right	Left	Right	Left	Left	Right
Median Width(ft)		36			42			12			12	
Link Offset(ft)		0			0			0			36	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		25	15		25	15		9
Number of Detectors	3	3			3	3	3		0			
Detector Template	Left					Right	Left					
Leading Detector (ft)	256	256			256	256	256		0			
Trailing Detector (ft)	-5	-5			-5	-5	-5		0			
Detector 1 Position(ft)	-5	-5			-5	-5	-5		-5			
Detector 1 Size(ft)	50	50			50	50	50		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 2 Position(ft)	125	125			125	125	125					
Detector 2 Size(ft)	6	6			6	6	6					
Detector 2 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex					
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0			0.0	0.0	0.0					
Detector 3 Position(ft)	250	250			250	250	250					
Detector 3 Size(ft)	6	6			6	6	6					
Detector 3 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex					
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0			0.0	0.0	0.0					

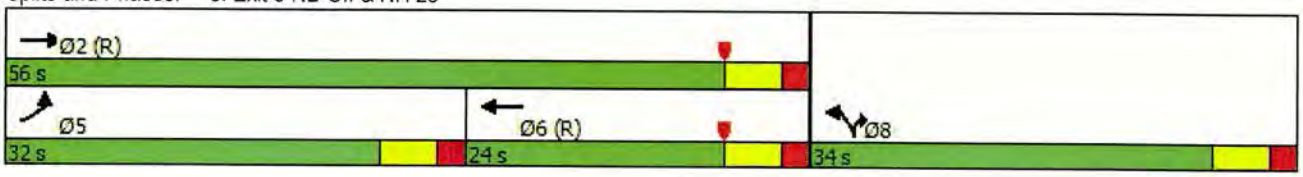
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Detector Phase	5	2			6		8		8			
Switch Phase												
Minimum Initial (s)	4.0	16.0			16.0		4.0		4.0			
Minimum Split (s)	10.0	23.0			23.0		11.0		11.0			
Total Split (s)	32.0	56.0			24.0		34.0		34.0			
Total Split (%)	35.6%	62.2%			26.7%		37.8%		37.8%			
Maximum Green (s)	26.0	50.0			18.0		28.0		28.0			
Yellow Time (s)	4.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	2.0	2.0			2.0		2.0		2.0			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.0		6.0		6.0			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		10.0			10.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	26.0	50.0			18.0	90.0	28.0		28.0			
Actuated g/C Ratio	0.29	0.56			0.20	1.00	0.31		0.31			
v/c Ratio	1.03	0.32			0.87	0.31	1.03		0.97			
Control Delay	49.0	2.2			49.7	0.5	79.7		47.8			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	49.0	2.2			49.7	0.5	79.7		47.8			
LOS	D	A			D	A	E		D			
Approach Delay		23.6			27.8			62.6				
Approach LOS		C			C			E				
Queue Length 50th (ft)	~321	8			177	0	~335		228			
Queue Length 95th (ft)	m#449	11			#270	0	298		199			
Internal Link Dist (ft)		613			462			787			312	
Turn Bay Length (ft)												
Base Capacity (vph)	506	1947			701	1568	529		649			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.03	0.32			0.87	0.31	1.03		0.97			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 38.3 Intersection LOS: D

Intersection Capacity Utilization 77.2% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Exit 5 NB Off & NH 28



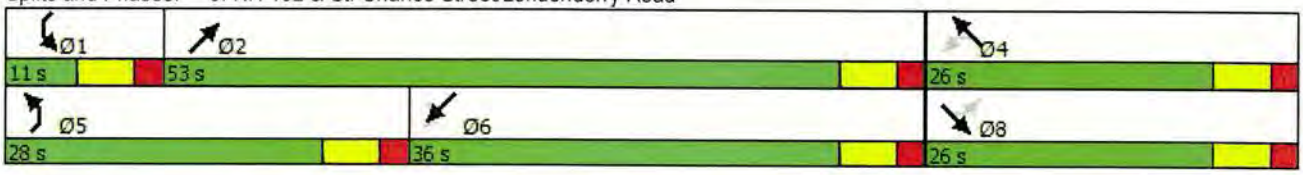
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	100	5	90	10	0	10	210	880	120	5	520	140
Future Volume (vph)	100	5	90	10	0	10	210	880	120	5	520	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		225	0		0	350		0	100		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.932			0.982			0.968	
Flt Protected		0.954			0.976		0.950			0.950		
Satd. Flow (prot)	0	1777	1583	0	1728	0	1770	3476	0	1770	3426	0
Flt Permitted		0.784			0.784		0.950			0.950		
Satd. Flow (perm)	0	1460	1583	0	1388	0	1770	3476	0	1770	3426	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182		182			25			41	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		593			447			750			330	
Travel Time (s)		13.5			10.2			17.0			7.5	
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	109	5	98	40	0	40	228	957	130	5	565	152
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	114	98	0	80	0	228	1087	0	5	717	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	3	1	3	1		3	3		3	3	
Detector Template	Left	Thru	Right	Left			Left	Thru		Left	Thru	
Leading Detector (ft)	256	256	45	256	45		256	256		256	256	
Trailing Detector (ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Position(ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	125	125		125			125	125		125	125	
Detector 2 Size(ft)	6	6		6			6	6		6	6	
Detector 2 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Detector 3 Position(ft)	250	250		250			250	250		250	250	
Detector 3 Size(ft)	6	6		6			6	6		6	6	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	custom	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Detector Phase	8	8	6	4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	8.0	5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		24.0	24.0		11.0	24.0	
Total Split (s)	26.0	26.0	36.0	26.0	26.0		28.0	53.0		11.0	36.0	
Total Split (%)	28.9%	28.9%	40.0%	28.9%	28.9%		31.1%	58.9%		12.2%	40.0%	
Maximum Green (s)	20.0	20.0	30.0	20.0	20.0		22.0	47.0		5.0	30.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lead/Lag			Lag				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	Min	None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0			0	
Act Effct Green (s)		11.8	24.9		11.5		14.7	47.1		5.6	24.9	
Actuated g/C Ratio		0.18	0.37		0.17		0.22	0.71		0.08	0.37	
v/c Ratio		0.44	0.14		0.21		0.58	0.44		0.03	0.55	
Control Delay		34.9	0.4		1.2		33.3	7.9		37.6	19.3	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		34.9	0.4		1.2		33.3	7.9		37.6	19.3	
LOS		C	A		A		C	A		D	B	
Approach Delay		18.9			1.2			12.4			19.4	
Approach LOS		B			A			B			B	
Queue Length 50th (ft)		47	0		0		93	98		2	118	
Queue Length 95th (ft)		105	0		0		181	257		14	220	
Internal Link Dist (ft)		513			367			670			250	
Turn Bay Length (ft)			225				350			100		
Base Capacity (vph)		493	891		589		657	2546		149	1755	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.23	0.11		0.14		0.35	0.43		0.03	0.41	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 66.7	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	

Maximum v/c Ratio: 0.58
Intersection Signal Delay: 14.8 Intersection LOS: B
Intersection Capacity Utilization 60.9% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 9: NH 102 & St. Charles Street/Londonderry Road



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	110	5	270	0	70	0	710	130	15	345	0
Future Volume (vph)	20	110	5	270	0	70	0	710	130	15	345	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.972			0.979				
Flt Protected		0.993			0.962						0.998	
Satd. Flow (prot)	0	1840	0	0	1725	0	0	1722	0	0	1806	0
Flt Permitted		0.920			0.583						0.701	
Satd. Flow (perm)	0	1705	0	0	1045	0	0	1722	0	0	1268	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			36			16				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		356			493			1124			603	
Travel Time (s)		8.1			11.2			25.5			13.7	
Peak Hour Factor	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Adj. Flow (vph)	33	183	8	281	0	73	0	798	146	17	401	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	224	0	0	354	0	0	944	0	0	418	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		-22			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	1		3	2			2		3	2	
Detector Template	Left			Left						Left		
Leading Detector (ft)	256	45		256	131			131		256	131	
Trailing Detector (ft)	-5	-5		-5	-5			-5		-5	-5	
Detector 1 Position(ft)	-5	-5		-5	-5			-5		-5	-5	
Detector 1 Size(ft)	50	50		50	50			50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 2 Position(ft)	125			125	125			125		125	125	
Detector 2 Size(ft)	6			6	6			6		6	6	
Detector 2 Type	Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0	0.0			0.0		0.0	0.0	
Detector 3 Position(ft)	250			250						250		
Detector 3 Size(ft)	6			6						6		
Detector 3 Type	Cl+Ex			Cl+Ex						Cl+Ex		
Detector 3 Channel												
Detector 3 Extend (s)	0.0			0.0						0.0		

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Detector Phase	4	4		4	4			2		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0			24.0		24.0	24.0	
Total Split (s)	34.0	34.0		34.0	34.0			56.0		56.0	56.0	
Total Split (%)	37.8%	37.8%		37.8%	37.8%			62.2%		62.2%	62.2%	
Maximum Green (s)	28.0	28.0		28.0	28.0			50.0		50.0	50.0	
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Recall Mode	None	None		None	None			Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		28.0			28.0			50.0			50.0	
Actuated g/C Ratio		0.31			0.31			0.56			0.56	
v/c Ratio		0.42			1.01			0.98			0.59	
Control Delay		27.4			82.1			45.6			17.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		27.4			82.1			45.6			17.7	
LOS		C			F			D			B	
Approach Delay		27.4			82.1			45.6			17.7	
Approach LOS		C			F			D			B	
Queue Length 50th (ft)		99			~189			484			147	
Queue Length 95th (ft)		101			#371			#769			224	
Internal Link Dist (ft)		276			413			1044			523	
Turn Bay Length (ft)												
Base Capacity (vph)		531			349			963			704	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.42			1.01			0.98			0.59	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 44.1		Intersection LOS: D	
Intersection Capacity Utilization 84.5%		ICU Level of Service E	

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: NH 102 & Fordway/Madden Hill Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	520	40	60	360	195	170	180	20	80	260	20
Future Volume (vph)	20	520	40	60	360	195	170	180	20	80	260	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989			0.947			0.985				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1724	0	1703	1697	0	1719	1782	0	1703	1792	1524
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1656	1724	0	1703	1697	0	1719	1782	0	1703	1792	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			26			5				136
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		505			530			361			411	
Travel Time (s)		11.5			12.0			8.2			9.3	
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.91	0.91	0.91
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	5%	5%	5%	6%	6%	6%
Parking (#/hr)			0									
Adj. Flow (vph)	21	542	42	64	383	207	200	212	24	88	286	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	584	0	64	590	0	200	236	0	88	286	22
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases												4
Detector Phase	5	2		1	6		3	8		7	4	5
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	10.0		4.0	10.0		4.0	9.0	4.0
Minimum Split (s)	10.0	30.0		10.0	30.0		10.0	25.0		10.0	25.0	10.0
Total Split (s)	10.0	51.0		10.0	51.0		30.0	43.0		16.0	29.0	10.0
Total Split (%)	8.3%	42.5%		8.3%	42.5%		25.0%	35.8%		13.3%	24.2%	8.3%
Maximum Green (s)	4.0	45.0		4.0	45.0		24.0	37.0		10.0	23.0	4.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Min		None	Min		Min	None		Min	None	None
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		10			10			0			10	
Act Effct Green (s)	4.1	40.0		4.1	44.7		17.6	29.1		9.2	20.7	30.9
Actuated g/C Ratio	0.04	0.37		0.04	0.42		0.16	0.27		0.09	0.19	0.29
v/c Ratio	0.33	0.90		1.00	0.81		0.71	0.48		0.60	0.82	0.04
Control Delay	69.8	51.2		167.1	39.2		58.0	36.3		68.5	63.4	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	69.8	51.2		167.1	39.2		58.0	36.3		68.5	63.4	0.1
LOS	E	D		F	D		E	D		E	E	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		51.8			51.7			46.2			61.0	
Approach LOS		D			D			D			E	
Queue Length 50th (ft)	15	386		~53	379		141	142		63	202	0
Queue Length 95th (ft)	#45	#641		#151	#636		208	204		#137	#358	0
Internal Link Dist (ft)		425			450			281			331	
Turn Bay Length (ft)												
Base Capacity (vph)	63	743		64	757		394	633		162	394	537
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.33	0.79		1.00	0.78		0.51	0.37		0.54	0.73	0.04

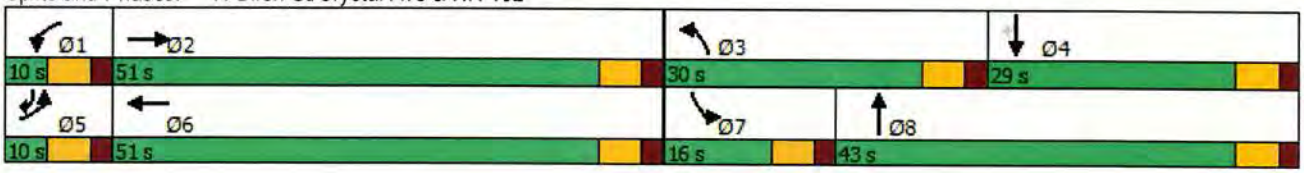
Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 106.9
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 52.4 Intersection LOS: D
Intersection Capacity Utilization 77.3% ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Birch St/Crystal Ave & NH 102



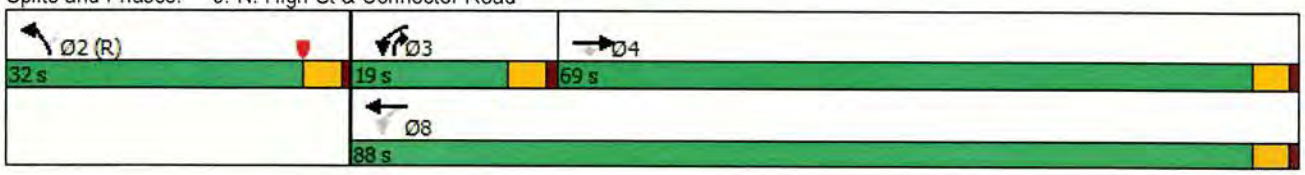
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱	↰	↑↑	↰↰	↱
Traffic Volume (vph)	1715	265	225	1025	660	460
Future Volume (vph)	1715	265	225	1025	660	460
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	250		0	400
Storage Lanes		1	1		2	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	1770	3539	3433	1583
Flt Permitted			0.058		0.950	
Satd. Flow (perm)	3539	1583	108	3539	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		209				9
Link Speed (mph)	30			30	30	
Link Distance (ft)	511			427	520	
Travel Time (s)	11.6			9.7	11.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1864	288	245	1114	717	500
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1864	288	245	1114	717	500
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov
Protected Phases	4		3	8	2	3
Permitted Phases		4	8			2
Detector Phase	4	4	3	8	2	3
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	29.5	29.5	9.5	29.5	29.5	9.5
Total Split (s)	69.0	69.0	19.0	88.0	32.0	19.0
Total Split (%)	57.5%	57.5%	15.8%	73.3%	26.7%	15.8%
Maximum Green (s)	64.5	64.5	14.5	83.5	27.5	14.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?	Yes	Yes	Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	C-Max	None
Walk Time (s)	5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	20.0	20.0		20.0	20.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	65.0	65.0	83.5	83.5	27.5	46.0
Actuated g/C Ratio	0.54	0.54	0.70	0.70	0.23	0.38
v/c Ratio	0.97	0.30	0.91	0.45	0.91	0.82
Control Delay	42.3	5.2	64.8	11.9	62.2	44.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	5.2	64.8	11.9	62.2	44.9

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
LOS	D	A	E	B	E	D
Approach Delay	37.3			21.4	55.1	
Approach LOS	D			C	E	
Queue Length 50th (ft)	713	29	147	200	280	336
Queue Length 95th (ft)	#913	75	m#258	m294	#389	#514
Internal Link Dist (ft)	431			347	440	
Turn Bay Length (ft)			250			400
Base Capacity (vph)	1916	953	275	2462	786	618
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.30	0.89	0.45	0.91	0.81

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 37.3 Intersection LOS: D
Intersection Capacity Utilization 90.0% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: N. High St & Connector Road



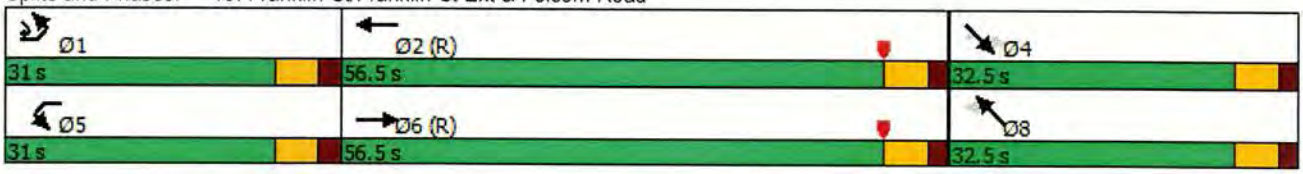
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	70	2075	30	120	960	80	20	10	90	200	30	60
Future Volume (vph)	70	2075	30	120	960	80	20	10	90	200	30	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		100	100		0	0		200	100		0
Storage Lanes	1		0	1		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								0.97				
Frt		0.998			0.989				0.850		0.900	
Flt Protected	0.950			0.950				0.967		0.950		
Satd. Flow (prot)	1687	4838	0	1719	3400	0	0	1801	1583	1805	1710	0
Flt Permitted	0.950			0.950				0.770		0.727		
Satd. Flow (perm)	1687	4838	0	1719	3400	0	0	1390	1583	1381	1710	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			9				45		77	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		333			347			309			251	
Travel Time (s)		7.6			7.9			7.0			5.7	
Confl. Peds. (#/hr)							40					
Peak Hour Factor	0.89	0.89	0.89	0.96	0.96	0.96	0.65	0.65	0.65	0.67	0.67	0.67
Heavy Vehicles (%)	7%	7%	7%	5%	5%	5%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	79	2331	34	125	1000	83	31	15	138	299	45	90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	79	2365	0	125	1083	0	0	46	138	299	135	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	1	6		5	2			4	1		8	
Permitted Phases							4		4	8		
Detector Phase	1	6		5	2		4	4	1	8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	31.0	31.0		31.0	31.0		31.0	31.0	31.0	32.5	32.5	
Total Split (s)	31.0	56.5		31.0	56.5		32.5	32.5	31.0	32.5	32.5	
Total Split (%)	25.8%	47.1%		25.8%	47.1%		27.1%	27.1%	25.8%	27.1%	27.1%	
Maximum Green (s)	25.0	50.5		25.0	50.5		26.5	26.5	25.0	26.5	26.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag				Lead			
Lead-Lag Optimize?	Yes	Yes		Yes	Yes				Yes			
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)	20.0	20.0		20.0	20.0		20.0	20.0	20.0	20.0	20.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	
Act Effct Green (s)	11.0	61.5		14.0	64.5			26.5	43.5	26.5	26.5	
Actuated g/C Ratio	0.09	0.51		0.12	0.54			0.22	0.36	0.22	0.22	
v/c Ratio	0.52	0.95		0.62	0.59			0.15	0.23	0.98	0.31	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Control Delay	67.1	28.4		63.5	20.8			39.3	18.0	94.7	19.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	67.1	28.4		63.5	20.8			39.3	18.0	94.7	19.9	
LOS	E	C		E	C			D	B	F	B	
Approach Delay		29.7			25.2			23.3			71.5	
Approach LOS		C			C			C			E	
Queue Length 50th (ft)	59	679		94	284			29	48	232	36	
Queue Length 95th (ft)	m61	m#789		151	382			45	56	#238	54	
Internal Link Dist (ft)		253			267			229			171	
Turn Bay Length (ft)	50			100					200	100		
Base Capacity (vph)	351	2480		358	1832			306	781	304	437	
Starvation Cap Reductn	0	0		0	0			0	0	0	0	
Spillback Cap Reductn	0	0		0	0			0	0	0	0	
Storage Cap Reductn	0	0		0	0			0	0	0	0	
Reduced v/c Ratio	0.23	0.95		0.35	0.59			0.15	0.18	0.98	0.31	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 32.4 Intersection LOS: C
Intersection Capacity Utilization 80.2% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Franklin St/Franklin St Ext & Folsom Road



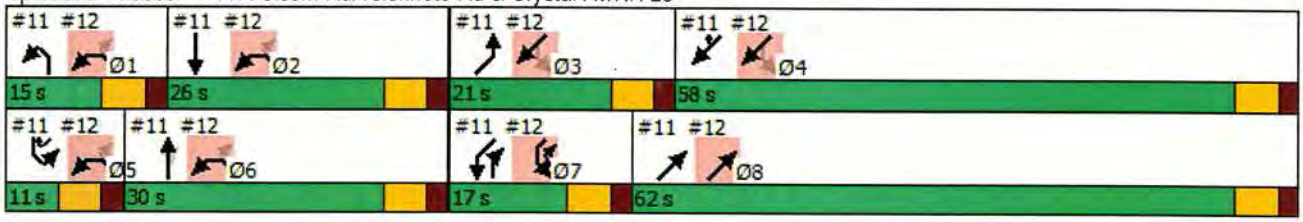
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	40	240	40	50	200	0	230	1380	340	45	820	235
Future Volume (vph)	40	240	40	50	200	0	230	1380	340	45	820	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	360		300	250		100	0		100
Storage Lanes	1		0	2		0	2		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt			0.850						0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	3471	1553	3335	3438	0	3400	3505	1568	1752	3505	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	3471	1553	3335	3438	0	3400	3505	1568	1752	3505	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82						191			130
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		622			1162			532			412	
Travel Time (s)		14.1			26.4			12.1			9.4	
Peak Hour Factor	0.84	0.84	0.84	0.79	0.79	0.79	0.86	0.86	0.86	0.99	0.99	0.99
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	48	286	48	63	253	0	267	1605	395	45	828	237
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	286	48	63	253	0	267	1605	395	45	828	237
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	1	6	7	5	2		3	8		7	4	4 5
Permitted Phases		6	6		2			8	Free		4	
Detector Phase	1	6	7	5	2		3	8		7	4	4 5
Switch Phase												
Minimum Initial (s)	6.0	8.0	5.0	7.0	8.0		7.0	8.0		5.0	8.0	
Minimum Split (s)	12.0	40.0	11.0	13.0	31.0		13.0	40.0		11.0	21.0	
Total Split (s)	15.0	30.0	17.0	11.0	26.0		21.0	62.0		17.0	58.0	
Total Split (%)	12.5%	25.0%	14.2%	9.2%	21.7%		17.5%	51.7%		14.2%	48.3%	
Maximum Green (s)	9.0	24.0	11.0	5.0	20.0		15.0	56.0		11.0	52.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max	None	None	Max		None	Max		None	None	
Act Effct Green (s)	9.0	24.0	38.6	5.0	20.0		15.0	57.5	119.1	8.6	51.1	62.1
Actuated g/C Ratio	0.08	0.20	0.32	0.04	0.17		0.13	0.48	1.00	0.07	0.43	0.52
v/c Ratio	0.37	0.41	0.09	0.45	0.44		0.62	0.95	0.25	0.36	0.55	0.27
Control Delay	61.2	43.7	1.9	66.8	47.5		56.7	42.8	0.4	79.9	19.7	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.5	0.0
Total Delay	61.2	43.7	1.9	66.8	47.5		56.7	42.8	0.4	79.9	20.2	3.7
LOS	E	D	A	E	D		E	D	A	E	C	A
Approach Delay		40.6			51.3			37.0			19.1	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		D			D			D			B	
Queue Length 50th (ft)	36	102	0	25	93		102	601	0	37	270	23
Queue Length 95th (ft)	71	135	5	43	118		140	#740	0	m65	310	45
Internal Link Dist (ft)		542			1082			452			332	
Turn Bay Length (ft)	150		150	360			250		100			100
Base Capacity (vph)	131	699	588	139	577		428	1691	1568	161	1530	875
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	319	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.41	0.08	0.45	0.44		0.62	0.95	0.25	0.28	0.68	0.27

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 119.1
Natural Cycle: 125
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 33.6 Intersection LOS: C
Intersection Capacity Utilization 74.8% ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Folsom Rd/Tsienneto Rd & Crystal Av/NH 28



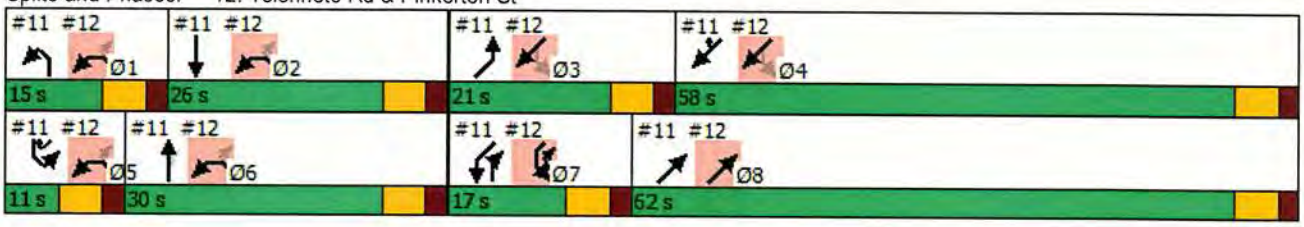
Lane Group	NWL	NWR	NET	NER	SWL	SWT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6
Lane Configurations												
Traffic Volume (vph)	205	90	920	550	80	1010						
Future Volume (vph)	205	90	920	550	80	1010						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900						
Storage Length (ft)	150	150		100	220							
Storage Lanes	0	1		1	1							
Taper Length (ft)	25				25							
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95						
Frt		0.850		0.850								
Flt Protected	0.950				0.950							
Satd. Flow (prot)	1770	1583	3505	1568	1770	3539						
Flt Permitted	0.950				0.149							
Satd. Flow (perm)	1770	1583	3505	1568	278	3539						
Right Turn on Red		Yes		Yes								
Satd. Flow (RTOR)		50		171								
Link Speed (mph)	30		30			30						
Link Distance (ft)	408		412			410						
Travel Time (s)	9.3		9.4			9.3						
Peak Hour Factor	0.83	0.83	0.86	0.86	0.81	0.81						
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%						
Adj. Flow (vph)	247	108	1070	640	99	1247						
Shared Lane Traffic (%)												
Lane Group Flow (vph)	247	108	1070	640	99	1247						
Turn Type	Prot	pm+ov	NA	Free	pm+pt	NA						
Protected Phases	1 2 5 6	7	8		7	3 4	1	2	3	4	5	6
Permitted Phases		1 2 5 6		Free	3 4							
Detector Phase	1 2 5 6	7	8		7	3 4						
Switch Phase												
Minimum Initial (s)		5.0	8.0		5.0		6.0	8.0	7.0	8.0	7.0	8.0
Minimum Split (s)		11.0	40.0		11.0		12.0	31.0	13.0	21.0	13.0	40.0
Total Split (s)		17.0	62.0		17.0		15.0	26.0	21.0	58.0	11.0	30.0
Total Split (%)		14.2%	51.7%		14.2%		13%	22%	18%	48%	9%	25%
Maximum Green (s)		11.0	56.0		11.0		9.0	20.0	15.0	52.0	5.0	24.0
Yellow Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		2.0	2.0		2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0							
Total Lost Time (s)		6.0	6.0		6.0							
Lead/Lag		Lead	Lag		Lead		Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?		Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode		None	Max		None		None	Max	None	None	None	Max
Act Effct Green (s)	33.0	47.6	57.5	119.1	72.1	72.1						
Actuated g/C Ratio	0.28	0.40	0.48	1.00	0.61	0.61						
v/c Ratio	0.50	0.16	0.63	0.41	0.36	0.58						
Control Delay	39.7	12.6	10.2	0.7	13.5	15.7						
Queue Delay	0.0	0.0	0.9	0.0	0.0	0.0						
Total Delay	39.7	12.6	11.1	0.7	13.5	15.7						
LOS	D	B	B	A	B	B						
Approach Delay	31.4		7.2			15.5						

Lane Group	NWL	NWR	NET	NER	SWL	SWT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6
Approach LOS	C		A			B						
Queue Length 50th (ft)	158	27	70	0	30	288						
Queue Length 95th (ft)	217	55	m104	m0	48	296						
Internal Link Dist (ft)	328		332			330						
Turn Bay Length (ft)	150	150		100	220							
Base Capacity (vph)	490	693	1691	1568	305	2169						
Starvation Cap Reductn	0	0	332	0	0	0						
Spillback Cap Reductn	0	0	0	0	0	41						
Storage Cap Reductn	0	0	0	0	0	0						
Reduced v/c Ratio	0.50	0.16	0.79	0.41	0.32	0.59						

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 119.1
Natural Cycle: 125
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 13.0 — Intersection LOS: B
Intersection Capacity Utilization 56.2% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 12: Tsienneto Rd & Pinkerton St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	170	300	5	20	550	40	15	10	15	20	10	170
Future Volume (vph)	170	300	5	20	550	40	15	10	15	20	10	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	150		150	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.990				0.850			0.850
Flt Protected	0.950			0.950				0.971			0.968	
Satd. Flow (prot)	1687	3367	0	1770	3504	0	0	1845	1615	0	1821	1599
Flt Permitted	0.950			0.950				0.797			0.769	
Satd. Flow (perm)	1687	3367	0	1770	3504	0	0	1514	1615	0	1447	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			10				109			189
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		277			1162			218			433	
Travel Time (s)		6.3			26.4			5.0			9.8	
Peak Hour Factor	0.83	0.83	0.83	0.92	0.92	0.92	0.50	0.50	0.50	0.90	0.90	0.90
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	205	361	6	22	598	43	30	20	30	22	11	189
Shared Lane Traffic (%)												
Lane Group Flow (vph)	205	367	0	22	641	0	0	50	30	0	33	189
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases					6		8	8	8	4		4
Detector Phase	5	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	46.0		11.0	43.0		33.0	33.0	33.0	33.0	33.0	33.0
Total Split (s)	14.0	46.0		11.0	43.0		33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	15.6%	51.1%		12.2%	47.8%		36.7%	36.7%	36.7%	36.7%	36.7%	36.7%
Maximum Green (s)	8.0	40.0		5.0	37.0		27.0	27.0	27.0	27.0	27.0	27.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max		None	None		None	None	None	None	None	None
Act Effct Green (s)	8.1	40.5		5.1	30.2			7.6	7.6		7.6	7.6
Actuated g/C Ratio	0.13	0.63		0.08	0.47			0.12	0.12		0.12	0.12
v/c Ratio	0.97	0.17		0.16	0.39			0.28	0.10		0.19	0.53
Control Delay	88.4	6.3		33.6	11.6			31.4	0.7		29.8	11.1
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Delay	88.4	6.3		33.6	11.6			31.4	0.7		29.8	11.1
LOS	F	A		C	B			C	A		C	B
Approach Delay		35.8			12.3			19.9			13.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		D			B			B			B	
Queue Length 50th (ft)	73	20		7	76			17	0		11	0
Queue Length 95th (ft)	#209	57		31	123			27	0		38	53
Internal Link Dist (ft)		197			1082			138			353	
Turn Bay Length (ft)	75			150								
Base Capacity (vph)	212	2125		139	2050			644	750		616	789
Starvation Cap Reductn	0	0		0	0			0	0		0	0
Spillback Cap Reductn	0	0		0	0			0	0		0	0
Storage Cap Reductn	0	0		0	0			0	0		0	0
Reduced v/c Ratio	0.97	0.17		0.16	0.31			0.08	0.04		0.05	0.24

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 64.1
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 21.7 Intersection LOS: C
Intersection Capacity Utilization 49.2% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

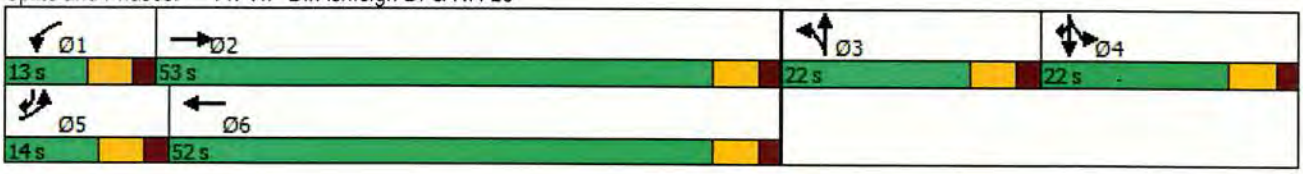
Splits and Phases: 13: Applebees/Linlew Dr & NH 28

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	330	5	5	430	140	30	10	10	320	5	150
Future Volume (vph)	30	330	5	5	430	140	30	10	10	320	5	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	0		0	0		0
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (ft)	200			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.998			0.963			0.925				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.954	
Satd. Flow (prot)	3303	3399	0	1736	3343	0	1805	1758	0	1665	1672	1568
Flt Permitted	0.950			0.950			0.950			0.950	0.954	
Satd. Flow (perm)	3303	3399	0	1736	3343	0	1805	1758	0	1665	1672	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			49			15				167
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		412			486			151			343	
Travel Time (s)		9.4			11.0			3.4			7.8	
Peak Hour Factor	0.83	0.83	0.83	0.97	0.97	0.97	0.67	0.67	0.67	0.90	0.90	0.90
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Adj. Flow (vph)	36	398	6	5	443	144	45	15	15	356	6	167
Shared Lane Traffic (%)										49%		
Lane Group Flow (vph)	36	404	0	5	587	0	45	30	0	182	180	167
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases								3				
Detector Phase	5	2		1	6		3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	5.0		8.0	8.0	
Minimum Split (s)	14.0	53.0		11.0	50.0		22.0	22.0		22.0	22.0	
Total Split (s)	14.0	53.0		13.0	52.0		22.0	22.0		22.0	22.0	
Total Split (%)	12.7%	48.2%		11.8%	47.3%		20.0%	20.0%		20.0%	20.0%	
Maximum Green (s)	8.0	47.0		7.0	46.0		16.0	16.0		16.0	16.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	6.5	28.3		6.1	17.4		7.5	7.5		13.2	13.2	26.1
Actuated g/C Ratio	0.10	0.43		0.09	0.26		0.11	0.11		0.20	0.20	0.39
v/c Ratio	0.11	0.28		0.03	0.64		0.22	0.14		0.55	0.54	0.23
Control Delay	33.0	15.6		33.8	24.4		33.9	22.9		33.8	33.5	4.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	33.0	15.6		33.8	24.4		33.9	22.9		33.8	33.5	4.2
LOS	C	B		C	C		C	C		C	C	A
Approach Delay		17.0			24.4			29.5			24.3	
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	7	56		2	108		18	6		73	72	0
Queue Length 95th (ft)	21	111		13	172		38	21		156	154	38
Internal Link Dist (ft)		332			406			71			263	
Turn Bay Length (ft)	150			150								
Base Capacity (vph)	421	2460		193	2396		460	459		424	426	733
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.09	0.16		0.03	0.24		0.10	0.07		0.43	0.42	0.23

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 66.3			
Natural Cycle: 110			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 22.6		Intersection LOS: C	
Intersection Capacity Utilization 44.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 14: VIP Dr/Ashleigh Dr & NH 28



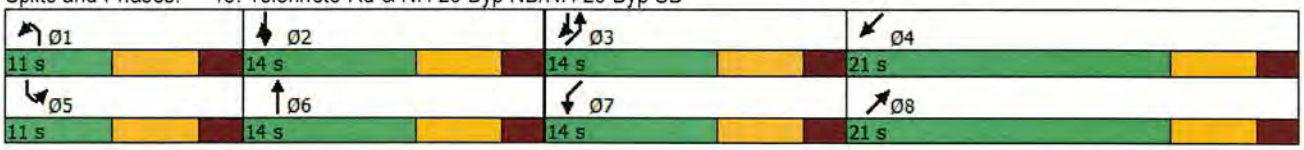
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	70	30	40	40	140	190	1010	60	20	340	70
Future Volume (vph)	30	70	30	40	40	140	190	1010	60	20	340	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	150		0	150		150
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.955				0.850		0.992			0.974	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1779	0	1787	1881	1599	1805	3581	0	1805	3516	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1779	0	1787	1881	1599	1805	3581	0	1805	3516	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29				164		9			38	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		481			347			479			371	
Travel Time (s)		10.9			7.9			10.9			8.4	
Peak Hour Factor	0.99	0.99	0.99	0.95	0.95	0.95	0.89	0.89	0.89	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	30	71	30	42	42	147	213	1135	67	22	366	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	101	0	42	42	147	213	1202	0	22	441	0
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases		6			2							
Detector Phase	1	6		5	2	2 3	3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	11.0	14.0		11.0	14.0		14.0	14.0		14.0	14.0	
Total Split (s)	11.0	14.0		11.0	14.0		14.0	21.0		14.0	21.0	
Total Split (%)	18.3%	23.3%		18.3%	23.3%		23.3%	35.0%		23.3%	35.0%	
Maximum Green (s)	5.0	8.0		5.0	8.0		8.0	15.0		8.0	15.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	Max		None	None		None	None	
Act Effct Green (s)	5.1	8.2		5.1	8.2	22.6	8.2	23.2		8.2	11.2	
Actuated g/C Ratio	0.10	0.16		0.10	0.16	0.45	0.16	0.47		0.16	0.23	
v/c Ratio	0.16	0.32		0.23	0.14	0.18	0.72	0.72		0.07	0.54	
Control Delay	26.3	19.6		27.2	22.4	2.9	40.7	18.8		22.2	18.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	26.3	19.6		27.2	22.4	2.9	40.7	18.8		22.2	18.7	
LOS	C	B		C	C	A	D	B		C	B	
Approach Delay		21.1			10.9			22.1			18.9	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		C			B			C			B	
Queue Length 50th (ft)	7	16		10	9	0	51	92		5	46	
Queue Length 95th (ft)	32	63		41	38	26	#183	#421		25	103	
Internal Link Dist (ft)		401			267			399			291	
Turn Bay Length (ft)	150			150		150	150			150		
Base Capacity (vph)	182	317		184	310	815	297	1676		297	1114	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.16	0.32		0.23	0.14	0.18	0.72	0.72		0.07	0.40	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 49.7
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 20.2 Intersection LOS: C
Intersection Capacity Utilization 60.4% ICU Level of Service B
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: Tsienneto Rd & NH 28 Byp NB/NH 28 Byp SB



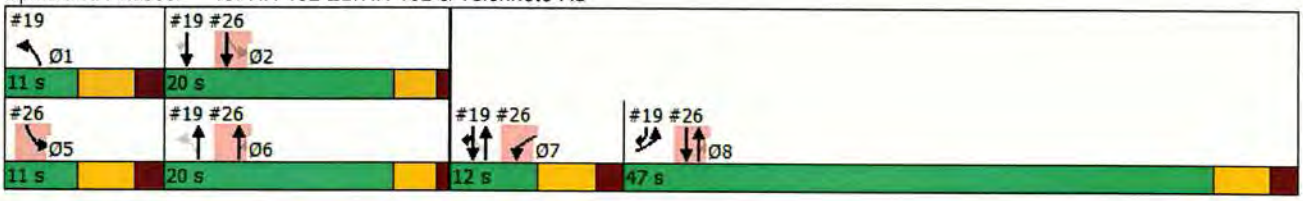
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø2	Ø5	Ø6	Ø7
Lane Configurations										
Traffic Volume (vph)	620	0	10	290	180	350				
Future Volume (vph)	620	0	10	290	180	350				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	200	0	100			90				
Storage Lanes	0	0	1			1				
Taper Length (ft)	25		25							
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Frt						0.850				
Flt Protected	0.950		0.950							
Satd. Flow (prot)	1787	0	1770	1863	1845	1568				
Flt Permitted	0.950		0.530							
Satd. Flow (perm)	1787	0	987	1863	1845	1568				
Right Turn on Red		Yes				Yes				
Satd. Flow (RTOR)						393				
Link Speed (mph)	30			30	30					
Link Distance (ft)	392			704	263					
Travel Time (s)	8.9			16.0	6.0					
Peak Hour Factor	0.90	0.90	0.87	0.87	0.89	0.89				
Heavy Vehicles (%)	1%	1%	2%	2%	3%	3%				
Adj. Flow (vph)	689	0	11	333	202	393				
Shared Lane Traffic (%)										
Lane Group Flow (vph)	689	0	11	333	202	393				
Turn Type	Prot		pm+pt	NA	NA	custom				
Protected Phases	8		1	6 7	2 7	7 8	2	5	6	7
Permitted Phases			6 7			2				
Detector Phase	8		1	6 7	2 7	7 8				
Switch Phase										
Minimum Initial (s)	5.0		5.0				5.0	5.0	5.0	5.0
Minimum Split (s)	26.5		11.0				9.0	11.0	9.0	11.0
Total Split (s)	47.0		11.0				20.0	11.0	20.0	12.0
Total Split (%)	52.2%		12.2%				22%	12%	22%	13%
Maximum Green (s)	41.0		5.0				16.0	5.0	16.0	6.0
Yellow Time (s)	4.0		4.0				3.0	4.0	3.0	4.0
All-Red Time (s)	2.0		2.0				1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0		0.0							
Total Lost Time (s)	6.0		6.0							
Lead/Lag	Lag		Lead				Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes		Yes				Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0		3.0				3.0	3.0	3.0	3.0
Recall Mode	None		None				Min	None	Min	None
Act Effct Green (s)	40.3		26.6	27.7	27.7	77.0				
Actuated g/C Ratio	0.50		0.33	0.35	0.35	0.96				
v/c Ratio	0.77		0.03	0.52	0.32	0.26				
Control Delay	24.2		17.1	25.2	24.3	0.4				
Queue Delay	0.1		0.0	0.0	1.4	0.0				
Total Delay	24.3		17.1	25.2	25.6	0.5				
LOS	C		B	C	C	A				
Approach Delay	24.3			25.0	9.0					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø2	Ø5	Ø6	Ø7
Approach LOS	C			C	A					
Queue Length 50th (ft)	250		4	127	76	0				
Queue Length 95th (ft)	#549		13	234	129	1				
Internal Link Dist (ft)	312			624	183					
Turn Bay Length (ft)	200		100			90				
Base Capacity (vph)	919		377	634	628	1517				
Starvation Cap Reductn	0		0	0	259	164				
Spillback Cap Reductn	12		0	0	0	0				
Storage Cap Reductn	0		0	0	0	0				
Reduced v/c Ratio	0.76		0.03	0.53	0.55	0.29				

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 80
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 18.9 — Intersection LOS: B
Intersection Capacity Utilization 57.9% — ICU Level of Service B
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 19: NH 102 EB/NH 102 & Tsienneto Rd



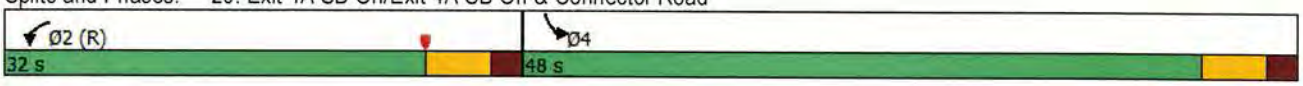
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰↰				↰↰	
Traffic Volume (vph)	875	0	0	0	1545	0
Future Volume (vph)	875	0	0	0	1545	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	1.00	0.97	1.00
Frt						
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3433	0	0	0	3433	0
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3433	0	0	0	3433	0
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (mph)	30		30			30
Link Distance (ft)	372		529			557
Travel Time (s)	8.5		12.0			12.7
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	931	0	0	0	1644	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	931	0	0	0	1644	0
Turn Type	Prot				Prot	
Protected Phases	2				4	
Permitted Phases						
Detector Phase	2				4	
Switch Phase						
Minimum Initial (s)	5.0				9.0	
Minimum Split (s)	24.0				24.0	
Total Split (s)	32.0				48.0	
Total Split (%)	40.0%				60.0%	
Maximum Green (s)	26.0				42.0	
Yellow Time (s)	4.0				4.0	
All-Red Time (s)	2.0				2.0	
Lost Time Adjust (s)	0.0				0.0	
Total Lost Time (s)	6.0				6.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0				3.0	
Recall Mode	C-Max				Min	
Act Effct Green (s)	26.0				42.0	
Actuated g/C Ratio	0.32				0.52	
v/c Ratio	0.83				0.91	
Control Delay	36.8				26.9	
Queue Delay	4.4				0.0	
Total Delay	41.2				26.9	
LOS	D				C	
Approach Delay	41.2					26.9
Approach LOS	D					C
Queue Length 50th (ft)	267				361	
Queue Length 95th (ft)	#334				#534	
Internal Link Dist (ft)	292		449			477

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Bay Length (ft)						
Base Capacity (vph)	1115				1802	
Starvation Cap Reductn	124				0	
Spillback Cap Reductn	0				0	
Storage Cap Reductn	0				0	
Reduced v/c Ratio	0.94				0.91	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 25 (31%), Referenced to phase 2:WBL, Start of Yellow
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 32.1 Intersection LOS: C
Intersection Capacity Utilization 131.8% ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 20: Exit 4A SB On/Exit 4A SB Off & Connector Road



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	875	0	0	0	1545	0
Future Volume (vph)	875	0	0	0	1545	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0				6.0	
Lane Util. Factor	0.97				0.97	
Frt	1.00				1.00	
Flt Protected	0.95				0.95	
Satd. Flow (prot)	3433				3433	
Flt Permitted	0.95				0.95	
Satd. Flow (perm)	3433				3433	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	931	0	0	0	1644	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	931	0	0	0	1644	0
Turn Type	Prot				Prot	
Protected Phases	2				4	
Permitted Phases						
Actuated Green, G (s)	26.0				42.0	
Effective Green, g (s)	26.0				42.0	
Actuated g/C Ratio	0.32				0.52	
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	1115				1802	
v/s Ratio Prot	c0.27				c0.48	
v/s Ratio Perm						
v/c Ratio	0.83				0.91	
Uniform Delay, d1	25.0				17.3	
Progression Factor	1.18				1.00	
Incremental Delay, d2	6.6				7.5	
Delay (s)	36.1				24.8	
Level of Service	D				C	
Approach Delay (s)	36.1		0.0			24.8
Approach LOS	D		A			C

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	131.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	875	0	0	0	1545	0
Future Volume (veh/h)	875	0	0	0	1545	0
Number	5	12			7	4
Initial Q (Qb), veh	0	0			0	0
Ped-Bike Adj(A_pbT)	1.00	1.00			1.00	
Parking Bus, Adj	1.00	1.00			1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0			1863	0
Adj Flow Rate, veh/h	931	0			1644	0
Adj No. of Lanes	2	0			2	0
Peak Hour Factor	0.94	0.94			0.94	0.94
Percent Heavy Veh, %	2	0			2	0
Cap, veh/h	0	0			0	0
Arrive On Green	0.00	0.00			0.00	0.00
Sat Flow, veh/h	0					0
Grp Volume(v), veh/h	0.0					0.0
Grp Sat Flow(s),veh/h/ln						
Q Serve(g_s), s						
Cycle Q Clear(g_c), s						
Prop In Lane						
Lane Grp Cap(c), veh/h						
V/C Ratio(X)						
Avail Cap(c_a), veh/h						
HCM Platoon Ratio						
Upstream Filter(I)						
Uniform Delay (d), s/veh						
Incr Delay (d2), s/veh						
Initial Q Delay(d3),s/veh						
%ile BackOfQ(50%),veh/ln						
LnGrp Delay(d),s/veh						
LnGrp LOS						
Approach Vol, veh/h						
Approach Delay, s/veh						
Approach LOS						

Timer	1	2	3	4	5	6	7	8
Assigned Phs								
Phs Duration (G+Y+Rc), s								
Change Period (Y+Rc), s								
Max Green Setting (Gmax), s								
Max Q Clear Time (g_c+I1), s								
Green Ext Time (p_c), s								

Intersection Summary	
HCM 2010 Ctrl Delay	0.0
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations		↑↑			↑↑	↱↱			↰	↱
Traffic Volume (vph)	0	1545	0	0	875	1240	0	0	0	710
Future Volume (vph)	0	1545	0	0	875	1240	0	0	0	710
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		200	0	0	0	0
Storage Lanes	0		0	0		2	0	0	1	1
Taper Length (ft)	25			25			25		25	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.88	1.00	1.00	1.00	0.95
Frt						0.850			0.850	0.850
Flt Protected										
Satd. Flow (prot)	0	3539	0	0	3539	2787	0	0	1583	1504
Flt Permitted										
Satd. Flow (perm)	0	3539	0	0	3539	2787	0	0	1583	1504
Right Turn on Red			Yes			Yes		Yes		
Satd. Flow (RTOR)						74				
Link Speed (mph)		30			30		30		30	
Link Distance (ft)		372			394		598		519	
Travel Time (s)		8.5			9.0		13.6		11.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1644	0	0	931	1319	0	0	0	755
Shared Lane Traffic (%)										50%
Lane Group Flow (vph)	0	1644	0	0	931	1319	0	0	378	377
Turn Type		NA			NA	Perm			Prot	Prot
Protected Phases		2			2				4	4
Permitted Phases						2				
Detector Phase		2			2	2			4	4
Switch Phase										
Minimum Initial (s)		5.0			5.0	5.0			9.0	9.0
Minimum Split (s)		24.0			24.0	24.0			24.0	24.0
Total Split (s)		49.0			49.0	49.0			31.0	31.0
Total Split (%)		61.3%			61.3%	61.3%			38.8%	38.8%
Maximum Green (s)		43.0			43.0	43.0			25.0	25.0
Yellow Time (s)		4.0			4.0	4.0			4.0	4.0
All-Red Time (s)		2.0			2.0	2.0			2.0	2.0
Lost Time Adjust (s)		0.0			0.0	0.0			0.0	0.0
Total Lost Time (s)		6.0			6.0	6.0			6.0	6.0
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)		3.0			3.0	3.0			3.0	3.0
Recall Mode		C-Max			C-Max	C-Max			Max	Max
Act Effct Green (s)		43.0			43.0	43.0			25.0	25.0
Actuated g/C Ratio		0.54			0.54	0.54			0.31	0.31
v/c Ratio		0.86			0.49	0.86			0.77	0.80
Control Delay		4.1			12.7	22.5			37.0	40.4
Queue Delay		0.2			0.1	0.0			0.0	0.0
Total Delay		4.4			12.8	22.5			37.0	40.4
LOS		A			B	C			D	D
Approach Delay		4.4			18.5				38.7	
Approach LOS		A			B				D	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Queue Length 50th (ft)		8			143	286			169	180
Queue Length 95th (ft)		m18			191	#413			#303	#330
Internal Link Dist (ft)		292			314		518		439	
Turn Bay Length (ft)						200				
Base Capacity (vph)		1902			1902	1532			494	470
Starvation Cap Reductn		28			0	0			0	0
Spillback Cap Reductn		0			200	0			0	0
Storage Cap Reductn		0			0	0			0	0
Reduced v/c Ratio		0.88			0.55	0.86			0.77	0.80

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 16.8 Intersection LOS: B
Intersection Capacity Utilization 117.6% ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 21: Exit 4A NB Off & Connector Road & Exit 4A NB On

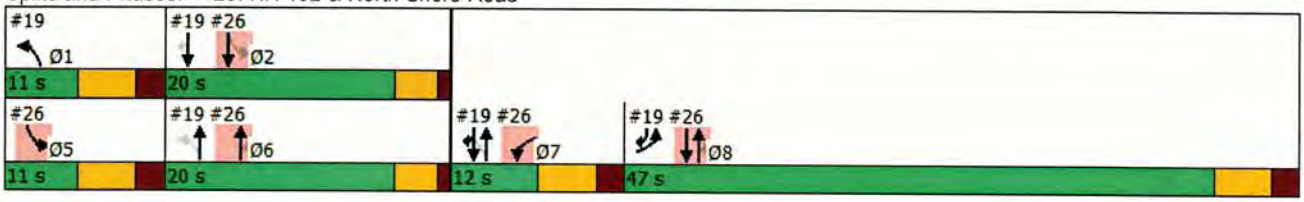
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø1	Ø2	Ø6	Ø8
Lane Configurations										
Traffic Volume (vph)	60	10	750	160	10	470				
Future Volume (vph)	60	10	750	160	10	470				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	0	0		90	100					
Storage Lanes	1	0		1	1					
Taper Length (ft)	25				25					
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Frt	0.976			0.850						
Flt Protected	0.961				0.950					
Satd. Flow (prot)	1768	0	1900	1615	1805	1900				
Flt Permitted	0.961				0.255					
Satd. Flow (perm)	1768	0	1900	1615	484	1900				
Right Turn on Red		Yes		Yes						
Satd. Flow (RTOR)	9			129						
Link Speed (mph)	30		30			30				
Link Distance (ft)	524		263			288				
Travel Time (s)	11.9		6.0			6.5				
Peak Hour Factor	0.87	0.67	0.95	0.84	0.73	0.96				
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%				
Adj. Flow (vph)	69	15	789	190	14	490				
Shared Lane Traffic (%)										
Lane Group Flow (vph)	84	0	789	190	14	490				
Turn Type	Prot		NA	Perm	custom	NA				
Protected Phases	7		6 8		5	2 8	1	2	6	8
Permitted Phases				6 8	2					
Detector Phase	7		6 8	6 8	5	2 8				
Switch Phase										
Minimum Initial (s)	5.0				5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	11.0				11.0		11.0	9.0	9.0	26.5
Total Split (s)	12.0				11.0		11.0	20.0	20.0	47.0
Total Split (%)	13.3%				12.2%		12%	22%	22%	52%
Maximum Green (s)	6.0				5.0		5.0	16.0	16.0	41.0
Yellow Time (s)	4.0				4.0		4.0	3.0	3.0	4.0
All-Red Time (s)	2.0				2.0		2.0	1.0	1.0	2.0
Lost Time Adjust (s)	0.0				0.0					
Total Lost Time (s)	6.0				6.0					
Lead/Lag	Lead				Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes				Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0				3.0		3.0	3.0	3.0	3.0
Recall Mode	None				None		None	Min	Min	None
Act Effct Green (s)	6.0		61.3	61.3	14.5	61.3				
Actuated g/C Ratio	0.08		0.77	0.77	0.18	0.77				
v/c Ratio	0.60		0.54	0.15	0.08	0.34				
Control Delay	53.1		2.8	0.8	26.6	3.3				
Queue Delay	0.0		0.7	0.3	0.0	0.0				
Total Delay	53.1		3.5	1.1	26.6	3.3				
LOS	D		A	A	C	A				
Approach Delay	53.1		3.1			4.0				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø1	Ø2	Ø6	Ø8
Approach LOS	D		A			A				
Queue Length 50th (ft)	36		31	0	6	46				
Queue Length 95th (ft)	#107		113	m9	16	69				
Internal Link Dist (ft)	444		183			208				
Turn Bay Length (ft)				90	100					
Base Capacity (vph)	141		1465	1275	170	1465				
Starvation Cap Reductn	0		349	659	0	0				
Spillback Cap Reductn	0		0	0	0	0				
Storage Cap Reductn	0		0	0	0	0				
Reduced v/c Ratio	0.60		0.71	0.31	0.08	0.33				

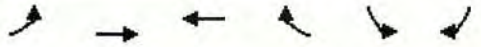
Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 80
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 6.0 Intersection LOS: A
Intersection Capacity Utilization 52.0% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 26: NH 102 & North Shore Road



APPENDIX P-1: 2040 ALTERNATIVE B INTERSECTION CAPACITY ANALYSES – HCS PRINOUTS – AM PEAK HOUR



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1280	720	0	385	925
Future Volume (vph)	0	1280	720	0	385	925
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		0.95	0.95		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3406		1930	2682
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3406		1930	2682
Peak-hour factor, PHF	0.93	0.93	0.88	0.88	0.89	0.89
Adj. Flow (vph)	0	1376	818	0	433	1039
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1376	818	0	433	1039
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		32.0	32.0		31.0	31.0
Effective Green, g (s)		32.0	32.0		31.0	31.0
Actuated g/C Ratio		0.43	0.43		0.41	0.41
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1480	1453		797	1108
v/s Ratio Prot		c0.40	0.24		0.22	c0.39
v/s Ratio Perm						
v/c Ratio		0.93	0.56		0.54	0.94
Uniform Delay, d1		20.4	16.2		16.6	21.1
Progression Factor		1.01	1.36		1.00	1.00
Incremental Delay, d2		5.3	0.4		0.8	14.4
Delay (s)		25.8	22.5		17.4	35.4
Level of Service		C	C		B	D
Approach Delay (s)		25.8	22.5		30.1	
Approach LOS		C	C		C	

Intersection Summary			
HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	485	0	245	0	0	1415	250	0	0	820	500
Future Volume (vph)	485	0	245	0	0	1415	250	0	0	820	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0	6.0			6.0	4.0
Lane Util. Factor	0.97		0.88			0.97	0.95			0.95	1.00
Frt	1.00		0.85			1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)	3242		2632			3335	3438			3505	1568
Flt Permitted	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (perm)	3242		2632			3335	3438			3505	1568
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	551	0	278	0	0	1505	266	0	0	891	543
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	551	0	278	0	0	1505	266	0	0	891	543
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Actuated Green, G (s)	25.0		25.0			67.0	113.0			40.0	150.0
Effective Green, g (s)	25.0		25.0			67.0	113.0			40.0	150.0
Actuated g/C Ratio	0.17		0.17			0.45	0.75			0.27	1.00
Clearance Time (s)	6.0		6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	540		438			1489	2589			934	1568
v/s Ratio Prot	c0.17		0.11			c0.45	0.08			c0.25	
v/s Ratio Perm											0.35
v/c Ratio	1.02		0.63			1.01	0.10			0.95	0.35
Uniform Delay, d1	62.5		58.2			41.5	4.9			54.1	0.0
Progression Factor	1.00		1.00			0.75	1.80			1.00	1.00
Incremental Delay, d2	44.0		3.0			19.5	0.0			20.2	0.6
Delay (s)	106.5		61.2			50.8	8.9			74.3	0.6
Level of Service	F		E			D	A			E	A
Approach Delay (s)		91.3		0.0			44.5			46.4	
Approach LOS		F		A			D			D	

Intersection Summary			
HCM 2000 Control Delay	54.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	690	420	260	730	0	0	0	0	105	0	385
Future Volume (vph)	0	690	420	260	730	0	0	0	0	105	0	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3167	1417	1687	3374					3303		1524
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3167	1417	1687	3374					3303		1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.73	0.73	0.73	0.92	0.92	0.92	0.74	0.74	0.74
Adj. Flow (vph)	0	750	457	356	1000	0	0	0	0	142	0	520
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	75
Lane Group Flow (vph)	0	750	457	356	1000	0	0	0	0	142	0	445
Heavy Vehicles (%)	14%	14%	14%	7%	7%	7%	2%	2%	2%	6%	6%	6%
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Actuated Green, G (s)		40.3	130.0	30.7	77.0					41.0		41.0
Effective Green, g (s)		40.3	130.0	30.7	77.0					41.0		41.0
Actuated g/C Ratio		0.31	1.00	0.24	0.59					0.32		0.32
Clearance Time (s)		6.0		6.0	6.0					6.0		6.0
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Lane Grp Cap (vph)		981	1417	398	1998					1041		480
v/s Ratio Prot		c0.24		c0.21	0.30					0.04		c0.29
v/s Ratio Perm			0.32									
v/c Ratio		0.76	0.32	0.89	0.50					0.14		0.93
Uniform Delay, d1		40.6	0.0	48.1	15.4					31.8		43.0
Progression Factor		1.00	1.00	0.38	0.15					1.00		1.00
Incremental Delay, d2		5.7	0.6	18.4	0.5					0.1		23.9
Delay (s)		46.2	0.6	36.9	2.7					31.9		67.0
Level of Service		D	A	D	A					C		E
Approach Delay (s)		28.9			11.7			0.0			59.4	
Approach LOS		C			B			A			E	

Intersection Summary			
HCM 2000 Control Delay	28.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	525	270	0	0	545	570	445	0	165	0	0	0
Future Volume (vph)	525	270	0	0	545	570	445	0	165	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1641	3282			3438	1538	1656		1482			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1641	3282			3438	1538	1656		1482			
Peak-hour factor, PHF	0.87	0.87	0.87	0.90	0.90	0.90	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	603	310	0	0	606	633	571	0	212	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	113	0	0	0
Lane Group Flow (vph)	603	310	0	0	606	633	571	0	99	0	0	0
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	9%	9%	9%	2%	2%	2%
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Actuated Green, G (s)	46.0	75.0			23.0	130.0	43.0		43.0			
Effective Green, g (s)	46.0	75.0			23.0	130.0	43.0		43.0			
Actuated g/C Ratio	0.35	0.58			0.18	1.00	0.33		0.33			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Lane Grp Cap (vph)	580	1893			608	1538	547		490			
v/s Ratio Prot	c0.37	0.09			c0.18		c0.34		0.07			
v/s Ratio Perm						0.41						
v/c Ratio	1.04	0.16			1.00	0.41	1.04		0.20			
Uniform Delay, d1	42.0	12.8			53.5	0.0	43.5		31.2			
Progression Factor	0.26	0.20			1.00	1.00	1.00		1.00			
Incremental Delay, d2	41.6	0.2			35.7	0.8	50.4		0.2			
Delay (s)	52.6	2.7			89.2	0.8	93.9		31.4			
Level of Service	D	A			F	A	F		C			
Approach Delay (s)		35.7			44.0			77.0			0.0	
Approach LOS		D			D			E			A	

Intersection Summary			
HCM 2000 Control Delay	50.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	0	150	0	1	0	60	410	0	5	1030	20
Future Volume (vph)	10	0	150	0	1	0	60	410	0	5	1030	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00		1.00	1.00		1.00	1.00	
Flt Protected		0.95	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1770	1583		1900		1770	3539		1770	3529	
Flt Permitted		1.00	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1863	1583		1900		1770	3539		1770	3529	
Peak-hour factor, PHF	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	0	163	0	4	0	65	446	0	5	1120	22
RTOR Reduction (vph)	0	0	59	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	11	104	0	4	0	65	446	0	5	1141	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	custom		NA		Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Actuated Green, G (s)		1.3	45.3		1.3		6.3	50.8		0.8	45.3	
Effective Green, g (s)		1.3	45.3		1.3		6.3	50.8		0.8	45.3	
Actuated g/C Ratio		0.02	0.64		0.02		0.09	0.72		0.01	0.64	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		34	1011		34		157	2535		19	2254	
v/s Ratio Prot					0.00		c0.04	c0.13		0.00	c0.32	
v/s Ratio Perm		c0.01	0.07									
v/c Ratio		0.32	0.10		0.12		0.41	0.18		0.26	0.51	
Uniform Delay, d1		34.4	4.9		34.2		30.6	3.3		34.8	6.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.5	0.0		1.5		1.8	0.0		7.3	0.2	
Delay (s)		39.8	5.0		35.8		32.3	3.3		42.0	7.0	
Level of Service		D	A		D		C	A		D	A	
Approach Delay (s)		7.2			35.8			7.0			7.2	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	70.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	50	0	350	0	40	0	360	110	15	545	0
Future Volume (vph)	10	50	0	350	0	40	0	360	110	15	545	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.99			0.97			1.00	
Flt Protected		0.99			0.96			1.00			1.00	
Satd. Flow (prot)		1847			1741			1703			1807	
Flt Permitted		0.91			0.68			1.00			0.98	
Satd. Flow (perm)		1694			1233			1703			1776	
Peak-hour factor, PHF	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	17	83	0	365	0	42	0	404	124	17	634	0
RTOR Reduction (vph)	0	0	0	0	23	0	0	13	0	0	0	0
Lane Group Flow (vph)	0	100	0	0	384	0	0	515	0	0	651	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Actuated Green, G (s)		28.5			28.5			36.1			36.1	
Effective Green, g (s)		28.5			28.5			36.1			36.1	
Actuated g/C Ratio		0.37			0.37			0.47			0.47	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		630			458			802			836	
v/s Ratio Prot								0.30				
v/s Ratio Perm		0.06			c0.31						c0.37	
v/c Ratio		0.16			0.84			0.64			0.78	
Uniform Delay, d1		16.0			22.0			15.4			16.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			12.7			1.8			4.6	
Delay (s)		16.2			34.7			17.1			21.5	
Level of Service		B			C			B			C	
Approach Delay (s)		16.2			34.7			17.1			21.5	
Approach LOS		B			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	76.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	220	60	20	340	190	150	200	20	60	260	20
Future Volume (vph)	70	220	60	20	340	190	150	200	20	60	260	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.95		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1656	1687		1703	1696		1719	1784		1703	1792	1524
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1656	1687		1703	1696		1719	1784		1703	1792	1524
Peak-hour factor, PHF	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.91	0.91	0.91
Adj. Flow (vph)	73	229	62	21	362	202	176	235	24	66	286	22
RTOR Reduction (vph)	0	10	0	0	22	0	0	4	0	0	0	18
Lane Group Flow (vph)	73	282	0	21	542	0	176	255	0	66	286	4
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	5%	5%	5%	6%	6%	6%
Parking (#/hr)			0									
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	3.7	33.6		1.9	31.8		10.3	19.8		7.4	16.9	16.9
Effective Green, g (s)	3.7	33.6		1.9	31.8		10.3	19.8		7.4	16.9	16.9
Actuated g/C Ratio	0.04	0.39		0.02	0.37		0.12	0.23		0.09	0.19	0.19
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	70	653		37	622		204	407		145	349	297
v/s Ratio Prot	c0.04	0.17		0.01	c0.32		c0.10	c0.14		0.04	c0.16	
v/s Ratio Perm												0.00
v/c Ratio	1.04	0.43		0.57	0.87		0.86	0.63		0.46	0.82	0.01
Uniform Delay, d1	41.5	19.5		42.0	25.5		37.5	30.1		37.7	33.4	28.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	119.9	0.5		18.4	12.7		29.2	3.0		2.3	13.9	0.0
Delay (s)	161.4	20.0		60.4	38.3		66.7	33.1		40.0	47.4	28.2
Level of Service	F	B		E	D		E	C		D	D	C
Approach Delay (s)		48.3			39.0			46.7			44.9	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	44.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	86.7	Sum of lost time (s)	24.0
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	200	10	5	50	300	310
Future Volume (vph)	200	10	5	50	300	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	120	0			220
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.996		
Satd. Flow (prot)	1719	1538	0	1820	1863	1583
Flt Permitted	0.950			0.996		
Satd. Flow (perm)	1719	1538	0	1820	1863	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	322			309	295	
Travel Time (s)	7.3			7.0	6.7	
Peak Hour Factor	0.89	0.89	0.91	0.91	0.93	0.93
Heavy Vehicles (%)	5%	5%	4%	4%	2%	2%
Adj. Flow (vph)	225	11	5	55	323	333
Shared Lane Traffic (%)						
Lane Group Flow (vph)	225	11	0	60	323	333
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	12.4
Intersection LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	200	10	5	50	300	310
Future Vol, veh/h	200	10	5	50	300	310
Peak Hour Factor	0.89	0.89	0.91	0.91	0.93	0.93
Heavy Vehicles, %	5	5	4	4	2	2
Mvmt Flow	225	11	5	55	323	333
Number of Lanes	1	1	0	1	1	1

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	2
HCM Control Delay	14	9.6	12.1
HCM LOS	B	A	B

Lane	NBLn1	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	9%	100%	0%	0%	0%
Vol Thru, %	91%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	55	200	10	300	310
LT Vol	5	200	0	0	0
Through Vol	50	0	0	300	0
RT Vol	0	0	10	0	310
Lane Flow Rate	60	225	11	323	333
Geometry Grp	4	7	7	7	7
Degree of Util (X)	0.1	0.422	0.017	0.483	0.434
Departure Headway (Hd)	5.946	6.76	5.548	5.388	4.683
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	605	535	649	665	760
Service Time	3.962	4.463	3.251	3.17	2.465
HCM Lane V/C Ratio	0.099	0.421	0.017	0.486	0.438
HCM Control Delay	9.6	14.3	8.3	13.2	11.1
HCM Lane LOS	A	B	A	B	B
HCM 95th-tile Q	0.3	2.1	0.1	2.6	2.2

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	0	0	250	610	10
Future Volume (vph)	10	0	0	250	610	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.998	
Flt Protected	0.950					
Satd. Flow (prot)	1008	0	0	1827	1789	0
Flt Permitted	0.950					
Satd. Flow (perm)	1008	0	0	1827	1789	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	160			224	319	
Travel Time (s)	3.6			5.1	7.3	
Peak Hour Factor	0.44	0.44	0.95	0.95	0.96	0.96
Heavy Vehicles (%)	79%	79%	4%	4%	6%	6%
Adj. Flow (vph)	23	0	0	263	635	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	0	0	263	645	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 42.7%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	0	0	250	610	10
Future Vol, veh/h	10	0	0	250	610	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	44	44	95	95	96	96
Heavy Vehicles, %	79	79	4	4	6	6
Mvmt Flow	23	0	0	263	635	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	903	640	645	0	-	0
Stage 1	640	-	-	-	-	-
Stage 2	263	-	-	-	-	-
Critical Hdwy	7.19	6.99	4.14	-	-	-
Critical Hdwy Stg 1	6.19	-	-	-	-	-
Critical Hdwy Stg 2	6.19	-	-	-	-	-
Follow-up Hdwy	4.211	4.011	2.236	-	-	-
Pot Cap-1 Maneuver	228	362	931	-	-	-
Stage 1	404	-	-	-	-	-
Stage 2	632	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	228	362	931	-	-	-
Mov Cap-2 Maneuver	228	-	-	-	-	-
Stage 1	404	-	-	-	-	-
Stage 2	632	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	931	-	228	-	-
HCM Lane V/C Ratio	-	-	0.1	-	-
HCM Control Delay (s)	0	-	22.5	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	50	210	0	0	360	10	5	20	140	120	10	0
Future Volume (vph)	50	210	0	0	360	10	5	20	140	120	10	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	0		0	150		150
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.996			0.886				
Flt Protected		0.991						0.998			0.956	
Satd. Flow (prot)	0	1760	0	0	1802	0	0	1647	0	0	1816	0
Flt Permitted		0.991						0.998			0.956	
Satd. Flow (perm)	0	1760	0	0	1802	0	0	1647	0	0	1816	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		327			240			246			251	
Travel Time (s)		7.4			5.5			5.6			5.7	
Peak Hour Factor	0.89	0.89	0.89	0.96	0.96	0.96	0.65	0.65	0.65	0.67	0.67	0.67
Heavy Vehicles (%)	7%	7%	7%	5%	5%	5%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	56	236	0	0	375	10	8	31	215	179	15	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	292	0	0	385	0	0	254	0	0	194	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.8%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	19.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	50	210	0	0	360	10	5	20	140	120	10	0
Future Vol, veh/h	50	210	0	0	360	10	5	20	140	120	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	96	96	96	65	65	65	67	67	67
Heavy Vehicles, %	7	7	7	5	5	5	2	2	2	0	0	0
Mvmt Flow	56	236	0	0	375	10	8	31	215	179	15	0

Major/Minor	Major1			Major2			Minor2			Minor1		
Conflicting Flow All	385	0	0	236	0	0	736	728	380	744	733	236
Stage 1	-	-	-	-	-	-	380	380	-	348	348	-
Stage 2	-	-	-	-	-	-	356	348	-	396	385	-
Critical Hdwy	4.17	-	-	4.15	-	-	7.12	6.52	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Follow-up Hdwy	2.263	-	-	2.245	-	-	3.518	4.018	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	1147	-	-	1314	-	-	335	350	667	333	350	808
Stage 1	-	-	-	-	-	-	642	614	-	672	638	-
Stage 2	-	-	-	-	-	-	661	634	-	633	614	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1147	-	-	1314	-	-	310	330	667	200	330	808
Mov Cap-2 Maneuver	-	-	-	-	-	-	310	330	-	200	330	-
Stage 1	-	-	-	-	-	-	606	614	-	634	602	-
Stage 2	-	-	-	-	-	-	609	598	-	407	614	-

Approach	EB	WB	SE	NW
HCM Control Delay, s	1.6	0	11.8	96.5
HCM LOS			B	F

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	WBL	WBT	WBR	SELn1
Capacity (veh/h)	206	1147	-	-	1314	-	-	786
HCM Lane V/C Ratio	0.942	0.049	-	-	-	-	-	0.323
HCM Control Delay (s)	96.5	8.3	0	-	0	-	-	11.8
HCM Lane LOS	F	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	7.8	0.2	-	-	0	-	-	1.4

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	200	120	375	200	0	30	165	20	40	225	595
Future Volume (vph)	20	200	120	375	200	0	30	165	20	40	225	595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	3471	1553	3335	3438		1752	1845	1568	1752	1845	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1736	3471	1553	3335	3438		1752	1845	1568	1752	1845	1568
Peak-hour factor, PHF	0.84	0.84	0.84	0.79	0.79	0.79	0.86	0.86	0.86	0.99	0.99	0.99
Adj. Flow (vph)	24	238	143	475	253	0	35	192	23	40	227	601
RTOR Reduction (vph)	0	0	95	0	0	0	0	0	0	0	0	237
Lane Group Flow (vph)	24	238	48	475	253	0	35	192	23	40	227	364
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	5	2		1	6		7	4		3	8	8 1
Permitted Phases		2	2		6			4	Free		8	
Actuated Green, G (s)	14.2	30.5	30.5	16.3	32.6		3.6	15.0	90.0	4.2	15.6	37.9
Effective Green, g (s)	14.2	30.5	30.5	16.3	32.6		3.6	15.0	90.0	4.2	15.6	37.9
Actuated g/C Ratio	0.16	0.34	0.34	0.18	0.36		0.04	0.17	1.00	0.05	0.17	0.42
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	273	1176	526	604	1245		70	307	1568	81	319	660
v/s Ratio Prot	0.01	0.07		c0.14	c0.07		0.02	0.10		c0.02	c0.12	0.23
v/s Ratio Perm			0.03						c0.01			
v/c Ratio	0.09	0.20	0.09	0.79	0.20		0.50	0.63	0.01	0.49	0.71	0.55
Uniform Delay, d1	32.4	21.1	20.3	35.2	19.8		42.3	34.9	0.0	41.9	35.1	19.6
Progression Factor	1.00	1.00	1.00	0.85	0.93		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.4	0.3	6.4	0.4		5.5	3.9	0.0	4.7	7.3	1.0
Delay (s)	33.0	21.5	20.6	36.4	18.7		47.8	38.8	0.0	46.5	42.4	20.6
Level of Service	C	C	C	D	B		D	D	A	D	D	C
Approach Delay (s)		21.9			30.3			36.5			27.5	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	170	70	350	310	60	690
Future Volume (vph)	170	70	350	310	60	690
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	180	0		0	180	
Storage Lanes	1	1		1	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.850		0.850		
Flt Protected	0.950					0.996
Satd. Flow (prot)	1770	1583	1845	1568	0	3525
Flt Permitted	0.950					0.996
Satd. Flow (perm)	1770	1583	1845	1568	0	3525
Link Speed (mph)	30		30			30
Link Distance (ft)	408		387			233
Travel Time (s)	9.3		8.8			5.3
Peak Hour Factor	0.83	0.83	0.86	0.86	0.81	0.81
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Adj. Flow (vph)	205	84	407	360	74	852
Shared Lane Traffic (%)						
Lane Group Flow (vph)	205	84	407	360	0	926
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 58.7%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	9.2

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	170	70	350	310	60	690
Future Vol, veh/h	170	70	350	310	60	690
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	180	0	-	0	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	83	83	86	86	81	81
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	205	84	407	360	74	852

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	981	407	0	0	407	0
Stage 1	407	-	-	-	-	-
Stage 2	574	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	261	643	-	-	1150	-
Stage 1	671	-	-	-	-	-
Stage 2	528	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	229	643	-	-	1150	-
Mov Cap-2 Maneuver	229	-	-	-	-	-
Stage 1	589	-	-	-	-	-
Stage 2	528	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	60	0	1
HCM LOS	F		

Minor Lane/Major Mvmt	NET	NER	NWLn1	NWLn2	SWL	SWT
Capacity (veh/h)	-	-	229	643	1150	-
HCM Lane V/C Ratio	-	-	0.894	0.131	0.064	-
HCM Control Delay (s)	-	-	80	11.4	8.3	0.4
HCM Lane LOS	-	-	F	B	A	A
HCM 95th %tile Q(veh)	-	-	7.4	0.5	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	790	0	0	680	30	5	0	5	10	0	70
Future Volume (vph)	10	790	0	0	680	30	5	0	5	10	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00			0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00			1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1687	3374			3517			1805	1615		1787	1599
Flt Permitted	0.95	1.00			1.00			0.75	1.00		0.75	1.00
Satd. Flow (perm)	1687	3374			3517			1434	1615		1420	1599
Peak-hour factor, PHF	0.83	0.83	0.83	0.92	0.92	0.92	0.50	0.50	0.50	0.90	0.90	0.90
Adj. Flow (vph)	12	952	0	0	739	33	10	0	10	11	0	78
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	9	0	0	73
Lane Group Flow (vph)	12	952	0	0	770	0	0	10	1	0	11	5
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases					6		8	8	8	4		4
Actuated Green, G (s)	1.6	72.7			65.1			5.3	5.3		5.3	5.3
Effective Green, g (s)	1.6	72.7			65.1			5.3	5.3		5.3	5.3
Actuated g/C Ratio	0.02	0.81			0.72			0.06	0.06		0.06	0.06
Clearance Time (s)	6.0	6.0			6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	29	2725			2543			84	95		83	94
v/s Ratio Prot	0.01	c0.28			0.22							
v/s Ratio Perm								0.01	0.00		c0.01	0.00
v/c Ratio	0.41	0.35			0.30			0.12	0.01		0.13	0.05
Uniform Delay, d1	43.7	2.3			4.4			40.1	39.9		40.2	40.0
Progression Factor	1.17	0.94			1.23			1.00	1.00		1.00	1.00
Incremental Delay, d2	8.1	0.3			0.1			0.6	0.0		0.7	0.2
Delay (s)	59.4	2.5			5.5			40.8	39.9		40.9	40.2
Level of Service	E	A			A			D	D		D	D
Approach Delay (s)		3.2			5.5			40.3			40.3	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	140	100	630	230	20	100	500	730	20	420	140
Future Volume (vph)	40	140	100	630	230	20	100	500	730	20	420	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	0.97	0.95		1.00	0.95	0.88	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	1792	1524	3367	3429		1805	3610	2842	1752	3505	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1703	1792	1524	3367	3429		1805	3610	2842	1752	3505	1568
Peak-hour factor, PHF	0.83	0.83	0.83	0.97	0.97	0.97	0.67	0.67	0.67	0.90	0.90	0.90
Adj. Flow (vph)	48	169	120	649	237	21	149	746	1090	22	467	156
RTOR Reduction (vph)	0	0	79	0	7	0	0	0	338	0	0	107
Lane Group Flow (vph)	48	169	41	649	251	0	149	746	752	22	467	49
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6		3	8	1	7	4	5
Permitted Phases			2						8		4	4
Actuated Green, G (s)	8.8	14.0	25.0	21.6	26.8		11.0	28.0	49.6	2.4	19.4	28.2
Effective Green, g (s)	8.8	14.0	25.0	21.6	26.8		11.0	28.0	49.6	2.4	19.4	28.2
Actuated g/C Ratio	0.10	0.16	0.28	0.24	0.30		0.12	0.31	0.55	0.03	0.22	0.31
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	166	278	524	808	1021		220	1123	1755	46	755	595
v/s Ratio Prot	0.03	c0.09	0.01	c0.19	0.07		c0.08	c0.21	0.10	0.01	0.13	0.01
v/s Ratio Perm			0.02						0.16			0.02
v/c Ratio	0.29	0.61	0.08	0.80	0.25		0.68	0.66	0.43	0.48	0.62	0.08
Uniform Delay, d1	37.7	35.4	24.0	32.2	23.9		37.8	26.9	11.9	43.2	32.0	21.8
Progression Factor	1.00	1.00	1.00	1.00	0.89		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	9.5	0.1	5.7	0.1		8.0	1.5	0.2	7.6	1.5	0.1
Delay (s)	38.7	45.0	24.1	38.0	21.5		45.8	28.4	12.0	50.8	33.5	21.8
Level of Service	D	D	C	D	C		D	C	B	D	C	C
Approach Delay (s)		36.6			33.3			20.7			31.2	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	20	190	310	10	40	40
Future Volume (vph)	20	190	310	10	40	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	140			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.996		0.932	
Flt Protected	0.950				0.976	
Satd. Flow (prot)	1687	1776	1820	0	1630	0
Flt Permitted	0.950				0.976	
Satd. Flow (perm)	1687	1776	1820	0	1630	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		535	210		522	
Travel Time (s)		12.2	4.8		11.9	
Peak Hour Factor	0.84	0.84	0.89	0.89	0.83	0.83
Heavy Vehicles (%)	7%	7%	4%	4%	6%	6%
Adj. Flow (vph)	24	226	348	11	48	48
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	226	359	0	96	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	190	310	10	40	40
Future Vol, veh/h	20	190	310	10	40	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	140	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	89	89	83	83
Heavy Vehicles, %	7	7	4	4	6	6
Mvmt Flow	24	226	348	11	48	48

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	359	0	-	0	628	354
Stage 1	-	-	-	-	354	-
Stage 2	-	-	-	-	274	-
Critical Hdwy	4.17	-	-	-	6.46	6.26
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.263	-	-	-	3.554	3.354
Pot Cap-1 Maneuver	1172	-	-	-	440	681
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	763	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1172	-	-	-	431	681
Mov Cap-2 Maneuver	-	-	-	-	431	-
Stage 1	-	-	-	-	688	-
Stage 2	-	-	-	-	763	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1172	-	-	-	528
HCM Lane V/C Ratio	0.02	-	-	-	0.183
HCM Control Delay (s)	8.1	-	-	-	13.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7

Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	170	360	20	20	110	110	10	10	110	140	40
Future Volume (vph)	10	170	360	20	20	110	110	10	10	110	140	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	150		0		150			0		0
Storage Lanes		1	0		0		0			0		0
Taper Length (ft)		25			25					25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.908				0.935					0.982	
Flt Protected		0.984				0.996					0.980	
Satd. Flow (prot)	0	1648	0	0	0	1718	0	0	0	0	1709	0
Flt Permitted		0.984				0.996					0.980	
Satd. Flow (perm)	0	1648	0	0	0	1718	0	0	0	0	1709	0
Link Speed (mph)		30				30					30	
Link Distance (ft)		465				456					371	
Travel Time (s)		10.6				10.4					8.4	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.86	0.86	0.86	0.86	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	7%	7%	7%	7%
Adj. Flow (vph)	11	187	396	22	23	128	128	12	13	138	175	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	616	0	0	0	291	0	0	0	0	376	0
Sign Control		Yield				Yield					Yield	

Intersection Summary			
Area Type:	Other		
Control Type: Roundabout			
Intersection Capacity Utilization 100.5%		ICU Level of Service G	
Analysis Period (min) 15			

Lane Group	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR
Lane Configurations		↔					↔	
Traffic Volume (vph)	50	60	110	100	5	30	120	10
Future Volume (vph)	50	60	110	100	5	30	120	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150			150		0
Storage Lanes	0		0			0		0
Taper Length (ft)	25					25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.911					0.992	
Flt Protected		0.992					0.990	
Satd. Flow (prot)	0	1590	0	0	0	0	1744	0
Flt Permitted		0.992					0.990	
Satd. Flow (perm)	0	1590	0	0	0	0	1744	0
Link Speed (mph)		30					30	
Link Distance (ft)		400					530	
Travel Time (s)		9.1					12.0	
Peak Hour Factor	0.60	0.60	0.60	0.60	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	8%	8%	8%	8%	7%	7%	7%	7%
Adj. Flow (vph)	83	100	183	167	6	36	145	12
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	533	0	0	0	0	199	0
Sign Control		Yield					Yield	

Intersection Summary

Intersection	
Intersection Delay, s/veh	14.9
Intersection LOS	B

Approach	WB	NB	SB	NE	SW
Entry Lanes	1	1	1	1	1
Conflicting Circle Lanes	1	1	1	1	1
Adj Approach Flow, veh/h	616	291	376	533	199
Demand Flow Rate, veh/h	635	300	403	576	213
Vehicles Circulating, veh/h	500	564	428	405	858
Vehicles Exiting, veh/h	364	417	643	426	277
Ped Vol Crossing Leg, #/h	0	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000	1.000
Approach Delay, s/veh	21.4	9.7	10.1	14.4	12.5
Approach LOS	C	A	B	B	B

Lane	Left	Left	Left	Left	Left
Designated Moves	LR	LTR	LTR	LTR	LTR
Assumed Moves	LR	LTR	LTR	LTR	LTR
RT Channelized					
Lane Util	1.000	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
Entry Flow, veh/h	635	300	403	576	213
Cap Entry Lane, veh/h	829	776	892	913	575
Entry HV Adj Factor	0.970	0.971	0.933	0.925	0.932
Flow Entry, veh/h	616	291	376	533	198
Cap Entry, veh/h	803	753	832	845	536
V/C Ratio	0.766	0.386	0.452	0.631	0.370
Control Delay, s/veh	21.4	9.7	10.1	14.4	12.5
LOS	C	A	B	B	B
95th %tile Queue, veh	7	2	2	5	2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	20	200	10	40	50	375	150	5	10	90	20
Future Volume (vph)	10	20	200	10	40	50	375	150	5	10	90	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.932			0.999			0.978	
Flt Protected		0.984			0.995			0.966			0.996	
Satd. Flow (prot)	0	1731	1495	0	1678	0	0	1780	0	0	1780	0
Flt Permitted		0.984			0.995			0.966			0.996	
Satd. Flow (perm)	0	1731	1495	0	1678	0	0	1780	0	0	1780	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		162			453			475			436	
Travel Time (s)		3.7			10.3			10.8			9.9	
Peak Hour Factor	0.82	0.82	0.82	0.70	0.70	0.70	0.75	0.75	0.75	0.71	0.71	0.71
Heavy Vehicles (%)	8%	8%	8%	5%	5%	5%	3%	3%	3%	4%	4%	4%
Adj. Flow (vph)	12	24	244	14	57	71	500	200	7	14	127	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	244	0	142	0	0	707	0	0	169	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 54.7%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	30.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↕			↕			↕	
Traffic Vol, veh/h	10	20	200	10	40	50	375	150	5	10	90	20
Future Vol, veh/h	10	20	200	10	40	50	375	150	5	10	90	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	70	70	70	75	75	75	71	71	71
Heavy Vehicles, %	8	8	8	5	5	5	3	3	3	4	4	4
Mvmt Flow	12	24	244	14	57	71	500	200	7	14	127	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1437	1376	141	1507	1387	204	155	0	0	207	0	0
Stage 1	169	169	-	1204	1204	-	-	-	-	-	-	-
Stage 2	1268	1207	-	303	183	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.15	6.55	6.25	4.13	-	-	4.14	-	-
Critical Hdwy Stg 1	6.18	5.58	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.545	4.045	3.345	2.227	-	-	2.236	-	-
Pot Cap-1 Maneuver	108	141	891	98	141	829	1419	-	-	1352	-	-
Stage 1	819	747	-	222	254	-	-	-	-	-	-	-
Stage 2	201	250	-	700	743	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	32	84	891	39	84	829	1419	-	-	1352	-	-
Mov Cap-2 Maneuver	32	84	-	39	84	-	-	-	-	-	-	-
Stage 1	493	739	-	134	153	-	-	-	-	-	-	-
Stage 2	69	151	-	486	735	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30	188.1	6.3	0.6
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1419	-	-	54	891	126	1352	-	-
HCM Lane V/C Ratio	0.352	-	-	0.678	0.274	1.134	0.01	-	-
HCM Control Delay (s)	8.9	0	-	159.1	10.6	188.1	7.7	0	-
HCM Lane LOS	A	A	-	F	B	F	A	A	-
HCM 95th %tile Q(veh)	1.6	-	-	2.8	1.1	8.4	0	-	-

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	50	20	20	40	100	10	140	70	65	330	65
Future Volume (vph)	30	50	20	20	40	100	10	140	70	65	330	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1767		1736	1827	1553	1770	1770		1787	1835	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1767		1736	1827	1553	1770	1770		1787	1835	
Peak-hour factor, PHF	0.82	0.82	0.82	0.81	0.81	0.81	0.68	0.68	0.68	0.78	0.78	0.78
Adj. Flow (vph)	37	61	24	25	49	123	15	206	103	83	423	83
RTOR Reduction (vph)	0	15	0	0	0	73	0	23	0	0	9	0
Lane Group Flow (vph)	37	70	0	25	49	50	15	286	0	83	497	0
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	4.8	22.0		3.2	20.4	32.8	6.4	23.8		7.0	24.4	
Effective Green, g (s)	4.8	22.0		3.2	20.4	32.8	6.4	23.8		7.0	24.4	
Actuated g/C Ratio	0.06	0.28		0.04	0.25	0.41	0.08	0.30		0.09	0.30	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	105	485		69	465	636	141	526		156	559	
v/s Ratio Prot	c0.02	c0.04		0.01	0.03	0.03	0.01	0.16		c0.05	c0.27	
v/s Ratio Perm												
v/c Ratio	0.35	0.14		0.36	0.11	0.08	0.11	0.54		0.53	0.89	
Uniform Delay, d1	36.1	21.9		37.4	22.8	14.4	34.1	23.5		34.9	26.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	0.1		3.2	0.5	0.1	0.3	1.2		3.5	15.8	
Delay (s)	38.1	22.0		40.6	23.3	14.4	34.5	24.7		38.4	42.3	
Level of Service	D	C		D	C	B	C	C		D	D	
Approach Delay (s)		26.9			20.0			25.1			41.8	
Approach LOS		C			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	32.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	510	10	20	70	140	600
Future Volume (vph)	510	10	20	70	140	600
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	0.95		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1771		1626	1712	1863	1583
Flt Permitted	0.95		0.63	1.00	1.00	1.00
Satd. Flow (perm)	1771		1078	1712	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.91	0.91	0.82	0.82
Adj. Flow (vph)	543	11	22	77	171	732
RTOR Reduction (vph)	1	0	0	0	0	180
Lane Group Flow (vph)	553	0	22	77	171	552
Heavy Vehicles (%)	2%	2%	11%	11%	2%	2%
Turn Type	Prot		pm+pt	NA	NA	custom
Protected Phases	8		1	6 7	2 7	7 8
Permitted Phases			6 7			2
Actuated Green, G (s)	30.6		32.3	30.6	29.7	60.3
Effective Green, g (s)	30.6		32.3	30.6	29.7	60.3
Actuated g/C Ratio	0.38		0.40	0.38	0.37	0.75
Clearance Time (s)	6.0		6.0			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap (vph)	677		446	654	691	1311
v/s Ratio Prot	c0.31		c0.00	0.04	0.09	c0.23
v/s Ratio Perm			0.02			0.11
v/c Ratio	0.82		0.05	0.12	0.25	0.42
Uniform Delay, d1	22.2		14.4	16.0	17.4	3.6
Progression Factor	1.00		1.00	1.00	1.12	0.87
Incremental Delay, d2	7.6		0.0	0.1	0.2	0.2
Delay (s)	29.8		14.5	16.1	19.6	3.3
Level of Service	C		B	B	B	A
Approach Delay (s)	29.8			15.7	6.4	
Approach LOS	C			B	A	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1135	0	0	0	1770	0
Future Volume (vph)	1135	0	0	0	1770	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0				6.0	
Lane Util. Factor	0.97				0.97	
Frt	1.00				1.00	
Flt Protected	0.95				0.95	
Satd. Flow (prot)	3433				3433	
Flt Permitted	0.95				0.95	
Satd. Flow (perm)	3433				3433	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1207	0	0	0	1883	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1207	0	0	0	1883	0
Turn Type	Prot				Prot	
Protected Phases	2				4	
Permitted Phases						
Actuated Green, G (s)	31.0				47.0	
Effective Green, g (s)	31.0				47.0	
Actuated g/C Ratio	0.34				0.52	
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	1182				1792	
v/s Ratio Prot	c0.35				c0.55	
v/s Ratio Perm						
v/c Ratio	1.02				1.05	
Uniform Delay, d1	29.5				21.5	
Progression Factor	0.53				1.00	
Incremental Delay, d2	28.7				36.0	
Delay (s)	44.3				57.5	
Level of Service	D				E	
Approach Delay (s)	44.3		0.0			57.5
Approach LOS	D		A			E

Intersection Summary			
HCM 2000 Control Delay	52.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	143.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations										
Traffic Volume (vph)	0	1770	0	0	1135	1205	0	0	0	865
Future Volume (vph)	0	1770	0	0	1135	1205	0	0	0	865
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0			6.0	6.0
Lane Util. Factor		0.95			0.95	0.88			1.00	0.95
Frt		1.00			1.00	0.85			0.85	0.85
Flt Protected		1.00			1.00	1.00			1.00	1.00
Satd. Flow (prot)		3539			3539	2787			1583	1504
Flt Permitted		1.00			1.00	1.00			1.00	1.00
Satd. Flow (perm)		3539			3539	2787			1583	1504
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1883	0	0	1207	1282	0	0	0	920
RTOR Reduction (vph)	0	0	0	0	0	16	0	0	0	0
Lane Group Flow (vph)	0	1883	0	0	1207	1266	0	0	460	460
Turn Type	Perm	NA			NA	Perm			Prot	Prot
Protected Phases		2			2				4	4
Permitted Phases	2					2				
Actuated Green, G (s)		50.0			50.0	50.0			28.0	28.0
Effective Green, g (s)		50.0			50.0	50.0			28.0	28.0
Actuated g/C Ratio		0.56			0.56	0.56			0.31	0.31
Clearance Time (s)		6.0			6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		1966			1966	1548			492	467
v/s Ratio Prot		c0.53			0.34				0.29	c0.31
v/s Ratio Perm						0.45				
v/c Ratio		0.96			0.61	0.82			0.93	0.99
Uniform Delay, d1		19.0			13.5	16.3			30.1	30.8
Progression Factor		1.13			1.00	1.00			1.00	1.00
Incremental Delay, d2		1.7			1.4	4.9			25.1	37.4
Delay (s)		23.1			14.9	21.2			55.2	68.2
Level of Service		C			B	C			E	E
Approach Delay (s)		23.1			18.2		0.0		61.7	
Approach LOS		C			B		A		E	

Intersection Summary			
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	129.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	380	10	10	390	10	20	50	10	10	60	100
Future Volume (vph)	100	380	10	10	390	10	20	50	10	10	60	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1855		1770	1856		1770	1815		1770	1863	1583
Flt Permitted	0.29	1.00		0.42	1.00		0.71	1.00		0.71	1.00	1.00
Satd. Flow (perm)	540	1855		789	1856		1331	1815		1331	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	413	11	11	424	11	22	54	11	11	65	109
RTOR Reduction (vph)	0	1	0	0	1	0	0	7	0	0	0	66
Lane Group Flow (vph)	109	423	0	11	434	0	22	58	0	11	65	43
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	29.0	25.3		23.4	22.5		22.6	22.6		22.6	22.6	26.3
Effective Green, g (s)	29.0	25.3		23.4	22.5		22.6	22.6		22.6	22.6	26.3
Actuated g/C Ratio	0.43	0.38		0.35	0.34		0.34	0.34		0.34	0.34	0.39
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	302	702		289	625		450	614		450	630	765
v/s Ratio Prot	c0.02	c0.23		0.00	c0.23			0.03			c0.03	0.00
v/s Ratio Perm	0.14			0.01			0.02			0.01		0.02
v/c Ratio	0.36	0.60		0.04	0.69		0.05	0.09		0.02	0.10	0.06
Uniform Delay, d1	12.4	16.7		14.3	19.2		14.9	15.1		14.7	15.2	12.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	1.5		0.1	3.3		0.2	0.3		0.1	0.3	0.0
Delay (s)	13.1	18.2		14.4	22.5		15.1	15.4		14.8	15.5	12.6
Level of Service	B	B		B	C		B	B		B	B	B
Approach Delay (s)		17.1			22.3			15.3			13.7	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	66.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	360	10	250	370	10	160
Future Volume (vph)	360	10	250	370	10	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	80
Storage Lanes		0	0		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.996					0.850
Flt Protected				0.980	0.950	
Satd. Flow (prot)	1855	0	0	1825	1770	1583
Flt Permitted				0.980	0.950	
Satd. Flow (perm)	1855	0	0	1825	1770	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	354			472	168	
Travel Time (s)	8.0			10.7	3.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	391	11	272	402	11	174
Shared Lane Traffic (%)						
Lane Group Flow (vph)	402	0	0	674	11	174
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 66.2%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↦			↤	↰	↱
Traffic Vol, veh/h	360	10	250	370	10	160
Future Vol, veh/h	360	10	250	370	10	160
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	80
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	391	11	272	402	11	174

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	402	0	1343	397
Stage 1	-	-	-	-	397	-
Stage 2	-	-	-	-	946	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1157	-	168	652
Stage 1	-	-	-	-	679	-
Stage 2	-	-	-	-	377	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1157	-	117	652
Mov Cap-2 Maneuver	-	-	-	-	117	-
Stage 1	-	-	-	-	473	-
Stage 2	-	-	-	-	377	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.7	14.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	117	652	-	-	1157	-
HCM Lane V/C Ratio	0.093	0.267	-	-	0.235	-
HCM Control Delay (s)	38.9	12.5	-	-	9.1	0
HCM Lane LOS	E	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	1.1	-	-	0.9	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	10	540	40	10	650
Future Volume (vph)	90	10	540	40	10	650
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1774		1900	1615	1805	1900
Flt Permitted	0.96		1.00	1.00	0.26	1.00
Satd. Flow (perm)	1774		1900	1615	487	1900
Peak-hour factor, PHF	0.87	0.67	0.95	0.84	0.73	0.96
Adj. Flow (vph)	103	15	568	48	14	677
RTOR Reduction (vph)	5	0	0	16	0	0
Lane Group Flow (vph)	113	0	568	32	14	677
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Turn Type	Prot		NA	Perm	custom	NA
Protected Phases	7		6 8		5	2 8
Permitted Phases				6 8	2	
Actuated Green, G (s)	8.1		47.1	47.1	16.4	46.2
Effective Green, g (s)	8.1		47.1	47.1	16.4	46.2
Actuated g/C Ratio	0.10		0.59	0.59	0.20	0.58
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	179		1118	950	113	1097
v/s Ratio Prot	c0.06		0.30		c0.00	c0.36
v/s Ratio Perm				0.02	0.02	
v/c Ratio	0.63		0.51	0.03	0.12	0.62
Uniform Delay, d1	34.5		9.7	6.9	25.9	11.1
Progression Factor	1.00		0.33	0.53	1.00	1.00
Incremental Delay, d2	6.8		0.3	0.0	0.5	1.0
Delay (s)	41.3		3.5	3.7	26.4	12.1
Level of Service	D		A	A	C	B
Approach Delay (s)	41.3		3.5			12.4
Approach LOS	D		A			B

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	30	20	530	630	20
Future Volume (vph)	10	30	20	530	630	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.904				0.994	
Flt Protected	0.986		0.950			
Satd. Flow (prot)	1694	0	1787	1900	1871	0
Flt Permitted	0.986		0.950			
Satd. Flow (perm)	1694	0	1787	1900	1871	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	332			288	365	
Travel Time (s)	7.5			6.5	8.3	
Peak Hour Factor	0.64	0.77	0.71	0.90	0.75	0.55
Heavy Vehicles (%)	0%	0%	1%	0%	1%	0%
Adj. Flow (vph)	16	39	28	589	840	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	55	0	28	589	876	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 44.4%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	30	20	530	630	20
Future Vol, veh/h	10	30	20	530	630	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	64	77	71	90	75	55
Heavy Vehicles, %	0	0	1	0	1	0
Mvmt Flow	16	39	28	589	840	36

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1503	858	876	0	-	0
Stage 1	858	-	-	-	-	-
Stage 2	645	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	135	359	775	-	-	-
Stage 1	419	-	-	-	-	-
Stage 2	526	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	130	359	775	-	-	-
Mov Cap-2 Maneuver	130	-	-	-	-	-
Stage 1	404	-	-	-	-	-
Stage 2	526	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.5	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	775	-	239	-	-
HCM Lane V/C Ratio	0.036	-	0.228	-	-
HCM Control Delay (s)	9.8	-	24.5	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.9	-	-

APPENDIX P-2: 2040 ALTERNATIVE B INTERSECTION CAPACITY ANALYSES – HCS PRINOUTS – PM PEAK HOUR

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1180	1385	0	390	1300
Future Volume (vph)	0	1180	1385	0	390	1300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		0.95	0.95		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3406		1930	2682
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3406		1930	2682
Peak-hour factor, PHF	0.93	0.93	0.88	0.88	0.89	0.89
Adj. Flow (vph)	0	1269	1574	0	438	1461
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1269	1574	0	438	1461
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		64.0	64.0		74.0	74.0
Effective Green, g (s)		64.0	64.0		74.0	74.0
Actuated g/C Ratio		0.43	0.43		0.49	0.49
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1480	1453		952	1323
v/s Ratio Prot		0.37	c0.46		0.23	c0.54
v/s Ratio Perm						
v/c Ratio		0.86	1.08		0.46	1.10
Uniform Delay, d1		38.9	43.0		24.9	38.0
Progression Factor		0.68	0.04		1.00	1.00
Incremental Delay, d2		4.6	38.9		0.4	58.5
Delay (s)		31.0	40.7		25.3	96.5
Level of Service		C	D		C	F
Approach Delay (s)		31.0	40.7		80.1	
Approach LOS		C	D		F	

Intersection Summary			
HCM 2000 Control Delay	53.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	1345	0	750	0	0	1140	430	0	0	310	330
Future Volume (vph)	1345	0	750	0	0	1140	430	0	0	310	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0	6.0			6.0	4.0
Lane Util. Factor	0.97		0.88			0.97	0.95			0.95	1.00
Frt	1.00		0.85			1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)	3242		2632			3335	3438			3505	1568
Flt Permitted	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (perm)	3242		2632			3335	3438			3505	1568
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	1528	0	852	0	0	1213	457	0	0	337	359
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1528	0	852	0	0	1213	457	0	0	337	359
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Actuated Green, G (s)	60.0		60.0			46.0	78.0			26.0	150.0
Effective Green, g (s)	60.0		60.0			46.0	78.0			26.0	150.0
Actuated g/C Ratio	0.40		0.40			0.31	0.52			0.17	1.00
Clearance Time (s)	6.0		6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	1296		1052			1022	1787			607	1568
v/s Ratio Prot	c0.47		0.32			c0.36	0.13			c0.10	
v/s Ratio Perm											0.23
v/c Ratio	1.18		0.81			1.19	0.26			0.56	0.23
Uniform Delay, d1	45.0		39.9			52.0	19.9			56.7	0.0
Progression Factor	1.00		1.00			0.65	0.40			1.00	1.00
Incremental Delay, d2	88.8		4.7			90.7	0.2			3.6	0.3
Delay (s)	133.8		44.6			124.3	8.1			60.3	0.3
Level of Service	F		D			F	A			E	A
Approach Delay (s)		101.9		0.0			92.5			29.4	
Approach LOS		F		A			F			C	

Intersection Summary			
HCM 2000 Control Delay	88.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	790	420	150	610	0	0	0	0	175	0	425
Future Volume (vph)	0	790	420	150	610	0	0	0	0	175	0	425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3471	1553	1719	3438					3367		1553
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3471	1553	1719	3438					3367		1553
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	0	908	483	174	709	0	0	0	0	192	0	467
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	159
Lane Group Flow (vph)	0	908	483	174	709	0	0	0	0	192	0	308
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Actuated Green, G (s)		36.5	90.0	12.8	55.3					22.7		22.7
Effective Green, g (s)		36.5	90.0	12.8	55.3					22.7		22.7
Actuated g/C Ratio		0.41	1.00	0.14	0.61					0.25		0.25
Clearance Time (s)		6.0		6.0	6.0					6.0		6.0
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Lane Grp Cap (vph)		1407	1553	244	2112					849		391
v/s Ratio Prot		c0.26		c0.10	0.21					0.06		c0.20
v/s Ratio Perm			0.31									
v/c Ratio		0.65	0.31	0.71	0.34					0.23		0.79
Uniform Delay, d1		21.5	0.0	36.8	8.4					26.7		31.4
Progression Factor		1.00	1.00	0.26	0.01					1.00		1.00
Incremental Delay, d2		2.3	0.5	7.4	0.2					0.1		10.0
Delay (s)		23.8	0.5	17.0	0.3					26.8		41.4
Level of Service		C	A	B	A					C		D
Approach Delay (s)		15.7			3.6			0.0			37.2	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	495	470	0	0	410	400	350	0	385	0	0	0
Future Volume (vph)	495	470	0	0	410	400	350	0	385	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1752	3505			3505	1568	1703		1524			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1752	3505			3505	1568	1703		1524			
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.67	0.67	0.67	0.92	0.92	0.92
Adj. Flow (vph)	538	511	0	0	451	440	522	0	575	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	236	0	0	0
Lane Group Flow (vph)	538	511	0	0	451	440	522	0	339	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	6%	6%	6%	2%	2%	2%
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Actuated Green, G (s)	27.0	50.6			17.6	90.0	27.4		27.4			
Effective Green, g (s)	27.0	50.6			17.6	90.0	27.4		27.4			
Actuated g/C Ratio	0.30	0.56			0.20	1.00	0.30		0.30			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Lane Grp Cap (vph)	525	1970			685	1568	518		463			
v/s Ratio Prot	c0.31	0.15			c0.13		c0.31		0.22			
v/s Ratio Perm						0.28						
v/c Ratio	1.02	0.26			0.66	0.28	1.01		0.73			
Uniform Delay, d1	31.5	10.1			33.4	0.0	31.3		28.0			
Progression Factor	0.25	0.30			1.00	1.00	1.00		1.00			
Incremental Delay, d2	40.8	0.3			4.9	0.4	41.5		5.9			
Delay (s)	48.7	3.3			38.3	0.4	72.8		33.9			
Level of Service	D	A			D	A	E		C			
Approach Delay (s)		26.6			19.6			52.4			0.0	
Approach LOS		C			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	80	5	120	10	0	10	210	830	120	5	610	100
Future Volume (vph)	80	5	120	10	0	10	210	830	120	5	610	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.93		1.00	0.98		1.00	0.98	
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1779	1583		1729		1770	3472		1770	3464	
Flt Permitted		0.81	1.00		0.79		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1505	1583		1408		1770	3472		1770	3464	
Peak-hour factor, PHF	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	5	130	40	0	40	228	902	130	5	663	109
RTOR Reduction (vph)	0	0	72	0	71	0	0	10	0	0	13	0
Lane Group Flow (vph)	0	92	58	0	9	0	228	1022	0	5	759	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	custom	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Actuated Green, G (s)		8.3	33.1		8.3		14.8	47.1		0.8	33.1	
Effective Green, g (s)		8.3	33.1		8.3		14.8	47.1		0.8	33.1	
Actuated g/C Ratio		0.11	0.45		0.11		0.20	0.63		0.01	0.45	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		168	706		157		353	2203		19	1545	
v/s Ratio Prot							c0.13	c0.29		0.00	0.22	
v/s Ratio Perm		c0.06	0.04		0.01							
v/c Ratio		0.55	0.08		0.06		0.65	0.46		0.26	0.49	
Uniform Delay, d1		31.2	11.8		29.5		27.3	7.0		36.4	14.6	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.6	0.1		0.2		4.0	0.2		7.3	0.2	
Delay (s)		34.8	11.9		29.6		31.3	7.2		43.7	14.8	
Level of Service		C	B		C		C	A		D	B	
Approach Delay (s)		21.4			29.6			11.5			15.0	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	74.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	80	5	250	0	60	0	680	130	15	345	0
Future Volume (vph)	20	80	5	250	0	60	0	680	130	15	345	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			0.98			1.00	
Flt Protected		0.99			0.96			1.00			1.00	
Satd. Flow (prot)		1834			1727			1721			1806	
Flt Permitted		0.91			0.64			1.00			0.82	
Satd. Flow (perm)		1677			1157			1721			1481	
Peak-hour factor, PHF	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	33	133	8	260	0	62	0	764	146	17	401	0
RTOR Reduction (vph)	0	2	0	0	26	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	172	0	0	297	0	0	902	0	0	418	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Actuated Green, G (s)		24.5			24.5			48.8			48.8	
Effective Green, g (s)		24.5			24.5			48.8			48.8	
Actuated g/C Ratio		0.29			0.29			0.57			0.57	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		481			332			984			847	
v/s Ratio Prot								c0.52				
v/s Ratio Perm		0.10			c0.26						0.28	
v/c Ratio		0.36			0.90			0.92			0.49	
Uniform Delay, d1		24.1			29.2			16.4			10.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.5			25.0			12.9			0.5	
Delay (s)		24.6			54.2			29.3			11.3	
Level of Service		C			D			C			B	
Approach Delay (s)		24.6			54.2			29.3			11.3	
Approach LOS		C			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	85.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	150	200	20	70	240	10	90	420	40	60	280	210
Future Volume (vph)	150	200	20	70	240	10	90	420	40	60	280	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.99		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1820		1752	1845	1568	1787	1857		1787	1760	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1820		1752	1845	1568	1787	1857		1787	1760	
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95	0.94	0.94	0.94
Adj. Flow (vph)	165	220	22	75	258	11	95	442	42	64	298	223
RTOR Reduction (vph)	0	5	0	0	0	8	0	4	0	0	30	0
Lane Group Flow (vph)	165	237	0	75	258	3	95	480	0	64	491	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4	5	5	2		1	6	
Permitted Phases						4						
Actuated Green, G (s)	10.5	20.5		6.9	16.9	24.5	7.6	28.9		4.7	26.0	
Effective Green, g (s)	10.5	20.5		6.9	16.9	24.5	7.6	28.9		4.7	26.0	
Actuated g/C Ratio	0.12	0.24		0.08	0.20	0.29	0.09	0.34		0.06	0.31	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	216	438		142	366	562	159	631		98	538	
v/s Ratio Prot	c0.09	c0.13		0.04	c0.14	0.00	c0.05	c0.26		0.04	c0.28	
v/s Ratio Perm						0.00						
v/c Ratio	0.76	0.54		0.53	0.70	0.01	0.60	0.76		0.65	0.91	
Uniform Delay, d1	36.1	28.2		37.5	31.7	21.6	37.2	25.0		39.4	28.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.8	1.4		3.5	6.1	0.0	5.9	8.4		14.5	19.9	
Delay (s)	50.8	29.5		41.0	37.8	21.6	43.2	33.4		53.9	48.3	
Level of Service	D	C		D	D	C	D	C		D	D	
Approach Delay (s)		38.2			38.0			35.0			48.9	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	40.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	460	10	5	100	200	245
Future Volume (vph)	460	10	5	100	200	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	120	0			220
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.998		
Satd. Flow (prot)	1787	1599	0	1859	1881	1599
Flt Permitted	0.950			0.998		
Satd. Flow (perm)	1787	1599	0	1859	1881	1599
Link Speed (mph)	30			30	30	
Link Distance (ft)	322			309	305	
Travel Time (s)	7.3			7.0	6.9	
Peak Hour Factor	0.90	0.90	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	1%	2%	2%	1%	1%
Adj. Flow (vph)	511	11	6	115	230	282
Shared Lane Traffic (%)						
Lane Group Flow (vph)	511	11	0	121	230	282
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	32.6
Intersection LOS	D

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	460	10	5	100	200	245
Future Vol, veh/h	460	10	5	100	200	245
Peak Hour Factor	0.90	0.90	0.87	0.87	0.87	0.87
Heavy Vehicles, %	1	1	2	2	1	1
Mvmt Flow	511	11	6	115	230	282
Number of Lanes	1	1	0	1	1	1

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	2
HCM Control Delay	55.5	12.3	14
HCM LOS	F	B	B

Lane	NBLn1	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	5%	100%	0%	0%	0%
Vol Thru, %	95%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	105	460	10	200	245
LT Vol	5	460	0	0	0
Through Vol	100	0	0	200	0
RT Vol	0	0	10	0	245
Lane Flow Rate	121	511	11	230	282
Geometry Grp	4	7	7	7	7
Degree of Util (X)	0.236	0.964	0.017	0.424	0.463
Departure Headway (Hd)	7.03	6.791	5.577	6.635	5.922
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	507	532	640	540	605
Service Time	5.123	4.543	3.328	4.414	3.7
HCM Lane V/C Ratio	0.239	0.961	0.017	0.426	0.466
HCM Control Delay	12.3	56.5	8.4	14.3	13.8
HCM Lane LOS	B	F	A	B	B
HCM 95th-tile Q	0.9	12.7	0.1	2.1	2.4

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	0	0	565	445	10
Future Volume (vph)	10	0	0	565	445	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.997	
Flt Protected	0.950					
Satd. Flow (prot)	1703	0	0	1881	1876	0
Flt Permitted	0.950					
Satd. Flow (perm)	1703	0	0	1881	1876	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	160			224	319	
Travel Time (s)	3.6			5.1	7.3	
Peak Hour Factor	0.50	0.50	0.93	0.93	0.86	0.86
Heavy Vehicles (%)	6%	6%	1%	1%	1%	1%
Adj. Flow (vph)	20	0	0	608	517	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	0	0	608	529	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	0	0	565	445	10
Future Vol, veh/h	10	0	0	565	445	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	93	93	86	86
Heavy Vehicles, %	6	6	1	1	1	1
Mvmt Flow	20	0	0	608	517	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1131	523	529	0	-	0
Stage 1	523	-	-	-	-	-
Stage 2	608	-	-	-	-	-
Critical Hdwy	6.46	6.26	4.11	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.354	2.209	-	-	-
Pot Cap-1 Maneuver	221	546	1043	-	-	-
Stage 1	587	-	-	-	-	-
Stage 2	536	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	221	546	1043	-	-	-
Mov Cap-2 Maneuver	221	-	-	-	-	-
Stage 1	587	-	-	-	-	-
Stage 2	536	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1043	-	221	-	-
HCM Lane V/C Ratio	-	-	0.09	-	-
HCM Control Delay (s)	0	-	22.9	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	90	480	5	40	220	110	200	40	230	5	140	20
Future Volume (vph)	90	480	5	40	220	110	200	40	230	5	140	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	0		0	150		150
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.960			0.934			0.984	
Flt Protected		0.992			0.995			0.979			0.999	
Satd. Flow (prot)	0	1864	0	0	1779	0	0	1737	0	0	1868	0
Flt Permitted		0.992			0.995			0.979			0.999	
Satd. Flow (perm)	0	1864	0	0	1779	0	0	1737	0	0	1868	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		327			240			246			251	
Travel Time (s)		7.4			5.5			5.6			5.7	
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.67	0.67	0.67	0.82	0.82	0.82
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	96	511	5	45	250	125	299	60	343	6	171	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	612	0	0	420	0	0	702	0	0	201	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 95.6%		ICU Level of Service F	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	90	480	5	40	220	110	200	40	230	5	140	20
Future Volume (Veh/h)	90	480	5	40	220	110	200	40	230	5	140	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.67	0.67	0.67	0.82	0.82	0.82
Hourly flow rate (vph)	96	511	5	45	250	125	299	60	343	6	171	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	375			516			1218	1110	312	1138	1170	514
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	375			516			1218	1110	312	1138	1170	514
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			96			0	68	53	91	0	96
cM capacity (veh/h)	1189			1050			1	186	732	66	171	565

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total	612	420	702	201
Volume Left	96	45	299	6
Volume Right	5	125	343	24
cSH	1189	1050	2	177
Volume to Capacity	0.08	0.04	353.23	1.13
Queue Length 95th (ft)	7	3	Err	257
Control Delay (s)	2.1	1.3	Err	161.6
Lane LOS	A	A	F	F
Approach Delay (s)	2.1	1.3	Err	161.6
Approach LOS			F	F

Intersection Summary				
Average Delay	3645.3			
Intersection Capacity Utilization	95.6%	ICU Level of Service		F
Analysis Period (min)	15			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	60	320	110	550	390	0	60	360	50	45	180	625
Future Volume (vph)	60	320	110	550	390	0	60	360	50	45	180	625
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	3539		1770	1863	1583	1787	1881	1599
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	3539		1770	1863	1583	1787	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.96	0.96	0.96	0.95	0.95	0.95
Adj. Flow (vph)	65	348	120	585	415	0	62	375	52	47	189	658
RTOR Reduction (vph)	0	0	90	0	0	0	0	0	39	0	0	88
Lane Group Flow (vph)	65	348	30	585	415	0	63	375	13	47	189	570
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6		7	4		3	8	1
Permitted Phases			2						4			8
Actuated Green, G (s)	6.8	27.6	27.6	25.2	46.0		7.0	26.8	26.8	6.4	26.2	51.4
Effective Green, g (s)	6.8	27.6	27.6	25.2	46.0		7.0	26.8	26.8	6.4	26.2	51.4
Actuated g/C Ratio	0.06	0.25	0.25	0.23	0.42		0.06	0.24	0.24	0.06	0.24	0.47
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	109	887	397	786	1479		112	453	385	103	448	834
v/s Ratio Prot	0.04	c0.10		c0.17	0.12		c0.04	c0.20		0.03	0.10	c0.16
v/s Ratio Perm			0.02						0.01			0.20
v/c Ratio	0.60	0.39	0.08	0.74	0.28		0.56	0.83	0.03	0.46	0.42	0.68
Uniform Delay, d1	50.3	34.2	31.5	39.4	21.1		50.0	39.4	31.7	50.1	35.5	22.9
Progression Factor	1.00	1.00	1.00	1.27	1.16		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.5	1.3	0.4	3.6	0.1		6.3	11.8	0.0	3.2	0.6	2.3
Delay (s)	58.7	35.5	31.8	53.5	24.5		56.3	51.2	31.8	53.3	36.1	25.3
Level of Service	E	D	C	D	C		E	D	C	D	D	C
Approach Delay (s)		37.5			41.5			49.8			29.0	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	140	100	550	520	80	710
Future Volume (vph)	140	100	550	520	80	710
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	180	150		0	180	
Storage Lanes	1	0		1	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.850		0.850		
Flt Protected	0.950					0.995
Satd. Flow (prot)	1787	1599	1881	1599	0	3556
Flt Permitted	0.950					0.995
Satd. Flow (perm)	1787	1599	1881	1599	0	3556
Link Speed (mph)	30		30			30
Link Distance (ft)	403		387			233
Travel Time (s)	9.2		8.8			5.3
Peak Hour Factor	0.86	0.86	0.96	0.96	0.85	0.85
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	163	116	573	542	94	835
Shared Lane Traffic (%)						
Lane Group Flow (vph)	163	116	573	542	0	929
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 68.7%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	10.1

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	140	100	550	520	80	710
Future Vol, veh/h	140	100	550	520	80	710
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	180	-	-	0	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	86	86	96	96	85	85
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	163	116	573	542	94	835

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1179	573	0	0	573	0
Stage 1	573	-	-	-	-	-
Stage 2	606	-	-	-	-	-
Critical Hdwy	6.615	6.215	-	-	4.115	-
Critical Hdwy Stg 1	5.415	-	-	-	-	-
Critical Hdwy Stg 2	5.815	-	-	-	-	-
Follow-up Hdwy	3.5095	3.3095	-	-	2.2095	-
Pot Cap-1 Maneuver	198	520	-	-	1004	-
Stage 1	565	-	-	-	-	-
Stage 2	510	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	163	520	-	-	1004	-
Mov Cap-2 Maneuver	163	-	-	-	-	-
Stage 1	466	-	-	-	-	-
Stage 2	510	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	79.5	0	1.4
HCM LOS	F		

Minor Lane/Major Mvmt	NET	NER	NWLn1	NWLn2	SWL	SWT
Capacity (veh/h)	-	-	163	520	1004	-
HCM Lane V/C Ratio	-	-	0.999	0.224	0.094	-
HCM Control Delay (s)	-	-	126.4	13.9	9	0.6
HCM Lane LOS	-	-	F	B	A	A
HCM 95th %tile Q(veh)	-	-	7.8	0.8	0.3	-

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	160	1185	5	20	890	80	15	10	15	10	10	60
Future Volume (vph)	160	1185	5	20	890	80	15	10	15	10	10	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1787	3572		1787	3530			1844	1615		1835	1599
Flt Permitted	0.95	1.00		0.95	1.00			0.80	1.00		0.83	1.00
Satd. Flow (perm)	1787	3572		1787	3530			1518	1615		1557	1599
Peak-hour factor, PHF	0.97	0.97	0.97	0.95	0.95	0.95	0.90	0.90	0.90	0.80	0.80	0.80
Adj. Flow (vph)	165	1222	5	21	937	84	17	11	17	12	12	75
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	16	0	0	71
Lane Group Flow (vph)	165	1227	0	21	1017	0	0	28	1	0	26	4
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4	4	4
Actuated Green, G (s)	15.4	82.4		3.2	70.2			6.4	6.4		6.4	6.4
Effective Green, g (s)	15.4	82.4		3.2	70.2			6.4	6.4		6.4	6.4
Actuated g/C Ratio	0.14	0.75		0.03	0.64			0.06	0.06		0.06	0.06
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	250	2675		51	2252			88	93		90	93
v/s Ratio Prot	c0.09	c0.34		0.01	0.29							
v/s Ratio Perm								c0.02	0.00		0.02	0.00
v/c Ratio	0.66	0.46		0.41	0.45			0.32	0.01		0.29	0.05
Uniform Delay, d1	44.8	5.3		52.5	10.1			49.7	48.8		49.6	48.9
Progression Factor	0.99	1.15		1.02	0.98			1.00	1.00		1.00	1.00
Incremental Delay, d2	5.3	0.5		4.4	0.5			2.1	0.0		1.8	0.2
Delay (s)	49.8	6.5		58.0	10.5			51.8	48.9		51.4	49.1
Level of Service	D	A		E	B			D	D		D	D
Approach Delay (s)		11.7			11.5			50.7			49.7	
Approach LOS		B			B			D			D	

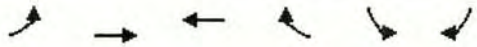
Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	180	140	820	300	20	130	640	940	30	530	180
Future Volume (vph)	50	180	140	820	300	20	130	640	940	30	530	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	4.5	6.0	6.0		4.5	6.0	6.0	4.5	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	0.97	0.95		1.00	0.95	0.88	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1881	1599	3433	3506		1805	3610	2842	1805	3610	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	1881	1599	3433	3506		1805	3610	2842	1805	3610	1615
Peak-hour factor, PHF	0.84	0.84	0.84	0.90	0.90	0.90	0.78	0.78	0.78	0.86	0.86	0.86
Adj. Flow (vph)	60	214	167	911	333	22	167	821	1205	35	616	209
RTOR Reduction (vph)	0	0	107	0	4	0	0	0	329	0	0	132
Lane Group Flow (vph)	60	214	60	911	351	0	167	821	876	35	616	77
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6		3	8	1	7	4	5
Permitted Phases			2						8		4	4
Actuated Green, G (s)	16.0	17.2	31.1	32.0	33.2		13.9	33.1	65.1	5.2	24.4	40.4
Effective Green, g (s)	16.0	17.2	31.1	32.0	33.2		13.9	33.1	65.1	5.2	24.4	40.4
Actuated g/C Ratio	0.15	0.16	0.28	0.29	0.30		0.13	0.30	0.59	0.05	0.22	0.37
Clearance Time (s)	6.0	6.0	4.5	6.0	6.0		4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	259	294	452	998	1058		228	1086	1836	85	800	681
v/s Ratio Prot	0.03	c0.11	0.02	c0.27	0.10		c0.09	c0.23	0.14	0.02	0.17	0.02
v/s Ratio Perm			0.02						0.17			0.03
v/c Ratio	0.23	0.73	0.13	0.91	0.33		0.73	0.76	0.48	0.41	0.77	0.11
Uniform Delay, d1	41.6	44.2	29.4	37.7	29.8		46.3	34.8	12.8	50.9	40.2	23.0
Progression Factor	1.00	1.00	1.00	0.97	1.40		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	14.6	0.1	11.9	0.2		11.5	3.0	0.2	3.2	4.6	0.1
Delay (s)	43.6	58.8	29.5	48.3	41.8		57.7	37.8	13.0	54.1	44.8	23.0
Level of Service	D	E	C	D	D		E	D	B	D	D	C
Approach Delay (s)		45.7			46.5			25.7			39.9	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	22.5
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	40	290	370	40	40	30
Future Volume (vph)	40	290	370	40	40	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	140			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.987		0.942	
Flt Protected	0.950				0.972	
Satd. Flow (prot)	1770	1863	1839	0	1689	0
Flt Permitted	0.950				0.972	
Satd. Flow (perm)	1770	1863	1839	0	1689	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		535	210		522	
Travel Time (s)		12.2	4.8		11.9	
Peak Hour Factor	0.91	0.91	0.90	0.90	0.75	0.75
Heavy Vehicles (%)	2%	2%	2%	2%	3%	3%
Adj. Flow (vph)	44	319	411	44	53	40
Shared Lane Traffic (%)						
Lane Group Flow (vph)	44	319	455	0	93	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	290	370	40	40	30
Future Vol, veh/h	40	290	370	40	40	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	140	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	90	90	75	75
Heavy Vehicles, %	2	2	2	2	3	3
Mvmt Flow	44	319	411	44	53	40

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	455	0	-	0	840	433
Stage 1	-	-	-	-	433	-
Stage 2	-	-	-	-	407	-
Critical Hdwy	4.12	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.218	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1106	-	-	-	334	621
Stage 1	-	-	-	-	652	-
Stage 2	-	-	-	-	670	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1106	-	-	-	321	621
Mov Cap-2 Maneuver	-	-	-	-	321	-
Stage 1	-	-	-	-	626	-
Stage 2	-	-	-	-	670	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	16.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1106	-	-	-	405
HCM Lane V/C Ratio	0.04	-	-	-	0.23
HCM Control Delay (s)	8.4	-	-	-	16.5
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9

Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	170	360	20	20	110	110	10	10	110	140	40
Future Volume (vph)	10	170	360	20	20	110	110	10	10	110	140	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	150		0		150			0		0
Storage Lanes		1	0		0		0			0		0
Taper Length (ft)		25			25					25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.908				0.935					0.982	
Flt Protected		0.984				0.996					0.980	
Satd. Flow (prot)	0	1648	0	0	0	1718	0	0	0	0	1709	0
Flt Permitted		0.984				0.996					0.980	
Satd. Flow (perm)	0	1648	0	0	0	1718	0	0	0	0	1709	0
Link Speed (mph)		30				30					30	
Link Distance (ft)		465				456					371	
Travel Time (s)		10.6				10.4					8.4	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.86	0.86	0.86	0.86	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	7%	7%	7%	7%
Adj. Flow (vph)	11	187	396	22	23	128	128	12	13	138	175	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	616	0	0	0	291	0	0	0	0	376	0
Sign Control		Yield				Yield					Yield	

Intersection Summary			
Area Type:	Other		
Control Type: Roundabout			
Intersection Capacity Utilization	100.5%	ICU Level of Service	G
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	21.1
Intersection LOS	C

Approach	WB	NB	SB	NE	SW
Entry Lanes	1	1	1	1	1
Conflicting Circle Lanes	1	1	1	1	1
Adj Approach Flow, veh/h	550	309	642	589	143
Demand Flow Rate, veh/h	555	316	648	595	146
Vehicles Circulating, veh/h	507	923	429	677	789
Vehicles Exiting, veh/h	732	349	506	400	273
Ped Vol Crossing Leg, #/h	0	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000	1.000
Approach Delay, s/veh	16.4	19.0	17.8	33.1	9.0
Approach LOS	C	C	C	D	A

Lane	Left	Left	Left	Left	Left
Designated Moves	LR	LTR	LTR	LTR	LTR
Assumed Moves	LR	LTR	LTR	LTR	LTR
RT Channelized					
Lane Util	1.000	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
Entry Flow, veh/h	555	316	648	595	146
Cap Entry Lane, veh/h	823	538	891	692	617
Entry HV Adj Factor	0.991	0.979	0.990	0.991	0.980
Flow Entry, veh/h	550	309	642	589	143
Cap Entry, veh/h	815	527	882	685	605
V/C Ratio	0.675	0.587	0.727	0.860	0.237
Control Delay, s/veh	16.4	19.0	17.8	33.1	9.0
LOS	C	C	C	D	A
95th %tile Queue, veh	5	4	7	10	1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	40	470	10	30	20	300	140	10	25	110	10
Future Volume (vph)	10	40	470	10	30	20	300	140	10	25	110	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.956			0.997			0.991	
Flt Protected		0.990			0.992			0.968			0.992	
Satd. Flow (prot)	0	1844	1583	0	1802	0	0	1816	0	0	1849	0
Flt Permitted		0.990			0.992			0.968			0.992	
Satd. Flow (perm)	0	1844	1583	0	1802	0	0	1816	0	0	1849	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		152			453			475			436	
Travel Time (s)		3.5			10.3			10.8			9.9	
Peak Hour Factor	0.88	0.88	0.88	0.82	0.82	0.82	0.93	0.93	0.93	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	11	45	534	12	37	24	323	151	11	27	121	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	56	534	0	73	0	0	485	0	0	159	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 50.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	12.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↔			↔			↔	
Traffic Vol, veh/h	10	40	470	10	30	20	300	140	10	25	110	10
Future Vol, veh/h	10	40	470	10	30	20	300	140	10	25	110	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	82	82	82	93	93	93	91	91	91
Heavy Vehicles, %	2	2	2	0	0	0	1	1	1	1	1	1
Mvmt Flow	11	45	534	12	37	24	323	151	11	27	121	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1014	989	127	1273	989	157	132	0	0	162	0	0
Stage 1	181	181	-	803	803	-	-	-	-	-	-	-
Stage 2	833	808	-	470	186	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	217	247	923	146	249	894	1459	-	-	1423	-	-
Stage 1	821	750	-	380	399	-	-	-	-	-	-	-
Stage 2	363	394	-	578	750	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	144	183	923	40	185	894	1459	-	-	1423	-	-
Mov Cap-2 Maneuver	144	183	-	40	185	-	-	-	-	-	-	-
Stage 1	621	734	-	288	302	-	-	-	-	-	-	-
Stage 2	235	298	-	224	734	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.1	57.3	5.4	1.3
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1459	-	-	174	923	138	1423	-	-
HCM Lane V/C Ratio	0.221	-	-	0.327	0.579	0.53	0.019	-	-
HCM Control Delay (s)	8.2	0	-	35.4	14.1	57.3	7.6	0	-
HCM Lane LOS	A	A	-	E	B	F	A	A	-
HCM 95th %tile Q(veh)	0.8	-	-	1.3	3.8	2.6	0.1	-	-

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	70	20	80	60	20	30	430	70	20	210	50
Future Volume (vph)	30	70	20	80	60	20	30	430	70	20	210	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1801		1787	1881	1599	1805	1860		1805	1845	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1801		1787	1881	1599	1805	1860		1805	1845	
Peak-hour factor, PHF	0.99	0.99	0.99	0.95	0.95	0.95	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	30	71	20	84	63	21	34	483	79	22	226	54
RTOR Reduction (vph)	0	11	0	0	0	12	0	7	0	0	11	0
Lane Group Flow (vph)	30	80	0	84	63	9	34	555	0	22	269	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases		6			2							
Actuated Green, G (s)	3.2	19.3		6.6	22.7	33.5	4.8	26.9		3.2	25.3	
Effective Green, g (s)	3.2	19.3		6.6	22.7	33.5	4.8	26.9		3.2	25.3	
Actuated g/C Ratio	0.04	0.24		0.08	0.28	0.42	0.06	0.34		0.04	0.32	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	70	434		147	533	669	108	625		72	583	
v/s Ratio Prot	0.02	c0.04		c0.05	c0.03	0.01	c0.02	c0.30		0.01	0.15	
v/s Ratio Perm												
v/c Ratio	0.43	0.18		0.57	0.12	0.01	0.31	0.89		0.31	0.46	
Uniform Delay, d1	37.5	24.1		35.3	21.2	13.6	36.0	25.1		37.3	21.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.2	0.2		5.3	0.5	0.0	1.7	14.3		2.4	0.6	
Delay (s)	41.7	24.3		40.6	21.7	13.6	37.7	39.4		39.7	22.5	
Level of Service	D	C		D	C	B	D	D		D	C	
Approach Delay (s)		28.6			30.1			39.3			23.7	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	33.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	660	10	40	140	100	720
Future Volume (vph)	660	10	40	140	100	720
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	0.95		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1789		1770	1863	1845	1568
Flt Permitted	0.95		0.65	1.00	1.00	1.00
Satd. Flow (perm)	1789		1217	1863	1845	1568
Peak-hour factor, PHF	0.90	0.90	0.87	0.87	0.89	0.89
Adj. Flow (vph)	733	11	46	161	112	809
RTOR Reduction (vph)	1	0	0	0	0	168
Lane Group Flow (vph)	743	0	46	161	112	641
Heavy Vehicles (%)	1%	1%	2%	2%	3%	3%
Turn Type	Prot		pm+pt	NA	NA	custom
Protected Phases	8		1	6 7	2 7	7 8
Permitted Phases			6 7			2
Actuated Green, G (s)	40.1		44.2	41.3	39.4	79.5
Effective Green, g (s)	40.1		44.2	41.3	39.4	79.5
Actuated g/C Ratio	0.40		0.44	0.41	0.39	0.79
Clearance Time (s)	6.0		6.0			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap (vph)	714		551	766	724	1335
v/s Ratio Prot	c0.42		c0.00	0.09	0.06	c0.26
v/s Ratio Perm			0.03			0.15
v/c Ratio	1.04		0.08	0.21	0.15	0.48
Uniform Delay, d1	30.2		16.2	19.0	19.7	3.5
Progression Factor	1.00		1.00	1.00	1.13	3.12
Incremental Delay, d2	44.9		0.1	0.1	0.1	0.2
Delay (s)	75.0		16.2	19.2	22.3	11.2
Level of Service	E		B	B	C	B
Approach Delay (s)	75.0			18.5	12.5	
Approach LOS	E			B	B	

Intersection Summary			
HCM 2000 Control Delay	38.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.4	Sum of lost time (s)	24.0
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1010	0	0	0	1575	0
Future Volume (vph)	1010	0	0	0	1575	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0				6.0	
Lane Util. Factor	0.97				0.97	
Frt	1.00				1.00	
Flt Protected	0.95				0.95	
Satd. Flow (prot)	3433				3433	
Flt Permitted	0.95				0.95	
Satd. Flow (perm)	3433				3433	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1074	0	0	0	1676	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1074	0	0	0	1676	0
Turn Type	Prot				Prot	
Protected Phases	2				4	
Permitted Phases						
Actuated Green, G (s)	27.0				41.0	
Effective Green, g (s)	27.0				41.0	
Actuated g/C Ratio	0.34				0.51	
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	1158				1759	
v/s Ratio Prot	c0.31				c0.49	
v/s Ratio Perm						
v/c Ratio	0.93				0.95	
Uniform Delay, d1	25.6				18.6	
Progression Factor	1.13				1.00	
Incremental Delay, d2	11.9				12.1	
Delay (s)	40.7				30.7	
Level of Service	D				C	
Approach Delay (s)	40.7		0.0			30.7
Approach LOS	D		A			C

Intersection Summary			
HCM 2000 Control Delay	34.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	129.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations										
Traffic Volume (vph)	0	1575	0	0	1010	1075	0	0	0	770
Future Volume (vph)	0	1575	0	0	1010	1075	0	0	0	770
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0			6.0	6.0
Lane Util. Factor		0.95			0.95	0.88			1.00	0.95
Frt		1.00			1.00	0.85			0.85	0.85
Flt Protected		1.00			1.00	1.00			1.00	1.00
Satd. Flow (prot)		3539			3539	2787			1583	1504
Flt Permitted		1.00			1.00	1.00			1.00	1.00
Satd. Flow (perm)		3539			3539	2787			1583	1504
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1676	0	0	1074	1144	0	0	0	819
RTOR Reduction (vph)	0	0	0	0	0	30	0	0	0	0
Lane Group Flow (vph)	0	1676	0	0	1074	1114	0	0	410	409
Turn Type	Perm	NA			NA	Perm			Prot	Prot
Protected Phases		2			2				4	4
Permitted Phases	2					2				
Actuated Green, G (s)		42.0			42.0	42.0			26.0	26.0
Effective Green, g (s)		42.0			42.0	42.0			26.0	26.0
Actuated g/C Ratio		0.52			0.52	0.52			0.32	0.32
Clearance Time (s)		6.0			6.0	6.0			6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		1857			1857	1463			514	488
v/s Ratio Prot		c0.47			0.30				0.26	c0.27
v/s Ratio Perm						0.40				
v/c Ratio		0.90			0.58	0.76			0.80	0.84
Uniform Delay, d1		17.2			13.0	15.0			24.6	25.0
Progression Factor		0.04			1.00	1.00			1.00	1.00
Incremental Delay, d2		2.7			1.3	3.8			12.2	15.7
Delay (s)		3.4			14.3	18.8			36.8	40.8
Level of Service		A			B	B			D	D
Approach Delay (s)		3.4			16.6		0.0		38.8	
Approach LOS		A			B		A		D	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	115.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	490	10	10	500	10	20	70	10	10	70	130
Future Volume (vph)	130	490	10	10	500	10	20	70	10	10	70	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1857		1770	1857		1770	1827		1770	1863	1583
Flt Permitted	0.20	1.00		0.33	1.00		0.71	1.00		0.70	1.00	1.00
Satd. Flow (perm)	369	1857		619	1857		1318	1827		1305	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	141	533	11	11	543	11	22	76	11	11	76	141
RTOR Reduction (vph)	0	1	0	0	1	0	0	8	0	0	0	89
Lane Group Flow (vph)	141	543	0	11	553	0	22	79	0	11	76	52
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	36.8	31.8		28.8	27.8		22.0	22.0		22.0	22.0	27.0
Effective Green, g (s)	36.8	31.8		28.8	27.8		22.0	22.0		22.0	22.0	27.0
Actuated g/C Ratio	0.51	0.44		0.40	0.38		0.30	0.30		0.30	0.30	0.37
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	282	811		260	709		398	552		394	562	717
v/s Ratio Prot	c0.03	c0.29		0.00	c0.30			c0.04			0.04	0.01
v/s Ratio Perm	0.22			0.02			0.02			0.01		0.03
v/c Ratio	0.50	0.67		0.04	0.78		0.06	0.14		0.03	0.14	0.07
Uniform Delay, d1	12.3	16.3		13.8	19.8		18.0	18.5		17.9	18.5	14.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	4.4		0.1	5.4		0.3	0.5		0.0	0.1	0.0
Delay (s)	13.7	20.7		13.9	25.2		18.3	19.1		17.9	18.6	14.9
Level of Service	B	C		B	C		B	B		B	B	B
Approach Delay (s)		19.3			25.0			18.9			16.2	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	72.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	460	0	290	470	0	210
Future Volume (vph)	460	0	290	470	0	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	80
Storage Lanes		0	0		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850
Flt Protected				0.981		
Satd. Flow (prot)	1863	0	0	1827	1863	1583
Flt Permitted				0.981		
Satd. Flow (perm)	1863	0	0	1827	1863	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	410			475	676	
Travel Time (s)	9.3			10.8	15.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	500	0	315	511	0	228
Shared Lane Traffic (%)						
Lane Group Flow (vph)	500	0	0	826	0	228
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 71.7%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	4.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↰	↱
Traffic Vol, veh/h	460	0	290	470	0	210
Future Vol, veh/h	460	0	290	470	0	210
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	80
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	500	0	315	511	0	228

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	500	0	1641	500
Stage 1	-	-	-	-	500	-
Stage 2	-	-	-	-	1141	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1064	-	110	571
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	305	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1064	-	65	571
Mov Cap-2 Maneuver	-	-	-	-	65	-
Stage 1	-	-	-	-	357	-
Stage 2	-	-	-	-	305	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.7	15.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	571	-	-	1064	-
HCM Lane V/C Ratio	-	0.4	-	-	0.296	-
HCM Control Delay (s)	0	15.4	-	-	9.8	0
HCM Lane LOS	A	C	-	-	A	A
HCM 95th %tile Q(veh)	-	1.9	-	-	1.2	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	80	10	640	160	10	740
Future Volume (vph)	80	10	640	160	10	740
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1772		1900	1615	1805	1900
Flt Permitted	0.96		1.00	1.00	0.22	1.00
Satd. Flow (perm)	1772		1900	1615	414	1900
Peak-hour factor, PHF	0.87	0.67	0.95	0.84	0.73	0.96
Adj. Flow (vph)	92	15	674	190	14	771
RTOR Reduction (vph)	6	0	0	41	0	0
Lane Group Flow (vph)	101	0	674	149	14	771
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Turn Type	Prot		NA	Perm	custom	NA
Protected Phases	7		6 8		5	2 8
Permitted Phases				6 8	2	
Actuated Green, G (s)	8.0		67.4	67.4	26.4	65.5
Effective Green, g (s)	8.0		67.4	67.4	26.4	65.5
Actuated g/C Ratio	0.08		0.67	0.67	0.26	0.65
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	141		1275	1084	122	1239
v/s Ratio Prot	c0.06		0.35		c0.00	c0.41
v/s Ratio Perm				0.09	0.03	
v/c Ratio	0.72		0.53	0.14	0.11	0.62
Uniform Delay, d1	45.1		8.4	6.0	28.2	10.2
Progression Factor	1.00		0.23	0.31	1.00	1.00
Incremental Delay, d2	16.1		0.2	0.0	0.4	1.0
Delay (s)	61.2		2.2	1.9	28.6	11.2
Level of Service	E		A	A	C	B
Approach Delay (s)	61.2		2.1			11.5
Approach LOS	E		A			B

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.4	Sum of lost time (s)	24.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	30	40	610	720	10
Future Volume (vph)	5	30	40	610	720	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.888				0.998	
Flt Protected	0.992		0.950			
Satd. Flow (prot)	1674	0	1787	1900	1878	0
Flt Permitted	0.992		0.950			
Satd. Flow (perm)	1674	0	1787	1900	1878	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	332			288	365	
Travel Time (s)	7.5			6.5	8.3	
Peak Hour Factor	0.64	0.77	0.71	0.90	0.75	0.55
Heavy Vehicles (%)	0%	0%	1%	0%	1%	0%
Adj. Flow (vph)	8	39	56	678	960	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	0	56	678	978	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	30	40	610	720	10
Future Vol, veh/h	5	30	40	610	720	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	64	77	71	90	75	55
Heavy Vehicles, %	0	0	1	0	1	0
Mvmt Flow	8	39	56	678	960	18

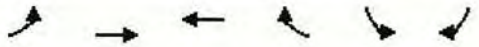
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1759	969	978	0	-	0
Stage 1	969	-	-	-	-	-
Stage 2	790	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	94	310	710	-	-	-
Stage 1	371	-	-	-	-	-
Stage 2	451	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	87	310	710	-	-	-
Mov Cap-2 Maneuver	87	-	-	-	-	-
Stage 1	342	-	-	-	-	-
Stage 2	451	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.1	0.8	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	710	-	217	-	-
HCM Lane V/C Ratio	0.079	-	0.216	-	-
HCM Control Delay (s)	10.5	-	26.1	-	-
HCM Lane LOS	B	-	D	-	-
HCM 95th %tile Q(veh)	0.3	-	0.8	-	-

APPENDIX P-3: 2040 ALTERNATIVE B INTERSECTION CAPACITY ANALYSES – SYNCHRO PRINOUTS – AM PEAK HOUR

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1280	720	0	385	925
Future Volume (vph)	0	1280	720	0	385	925
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.88
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3471	3406	0	1930	2682
Flt Permitted					0.950	
Satd. Flow (perm)	0	3471	3406	0	1930	2682
Right Turn on Red				Yes		No
Satd. Flow (RTOR)						
Link Speed (mph)		30	30		25	
Link Distance (ft)		712	388		212	
Travel Time (s)		16.2	8.8		5.8	
Peak Hour Factor	0.93	0.93	0.88	0.88	0.89	0.89
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Adj. Flow (vph)	0	1376	818	0	433	1039
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1376	818	0	433	1039
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		24	24		16	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	0.85	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors		3	3		3	3
Detector Template		Thru	Thru		Left	
Leading Detector (ft)		256	256		256	256
Trailing Detector (ft)		-5	-5		-5	-5
Detector 1 Position(ft)		-5	-5		-5	-5
Detector 1 Size(ft)		50	50		50	50
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		125	125		125	125
Detector 2 Size(ft)		6	6		6	6
Detector 2 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0		0.0	0.0
Detector 3 Position(ft)		250	250		250	250
Detector 3 Size(ft)		6	6		6	6
Detector 3 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 3 Channel						



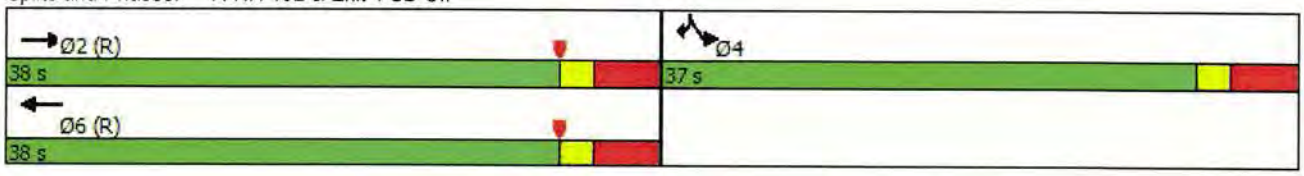
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 3 Extend (s)		0.0	0.0		0.0	0.0
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0		5.0	5.0
Minimum Split (s)		14.0	21.0		27.0	27.0
Total Split (s)		38.0	38.0		37.0	37.0
Total Split (%)		50.7%	50.7%		49.3%	49.3%
Maximum Green (s)		32.0	32.0		31.0	31.0
Yellow Time (s)		2.0	2.0		2.0	2.0
All-Red Time (s)		4.0	4.0		4.0	4.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		14.0	14.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		32.0	32.0		31.0	31.0
Actuated g/C Ratio		0.43	0.43		0.41	0.41
v/c Ratio		0.93	0.56		0.54	0.94
Control Delay		26.5	22.7		19.8	38.4
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		26.5	22.7		19.8	38.4
LOS		C	C		B	D
Approach Delay		26.5	22.7		32.9	
Approach LOS		C	C		C	
Queue Length 50th (ft)		306	382		148	254
Queue Length 95th (ft)		m333	m387		228	#390
Internal Link Dist (ft)		632	308		132	
Turn Bay Length (ft)						
Base Capacity (vph)		1480	1453		797	1108
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.93	0.56		0.54	0.94

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94

Intersection Signal Delay: 28.2 Intersection LOS: C
Intersection Capacity Utilization 68.7% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: NH 102 & Exit 4 SB Off



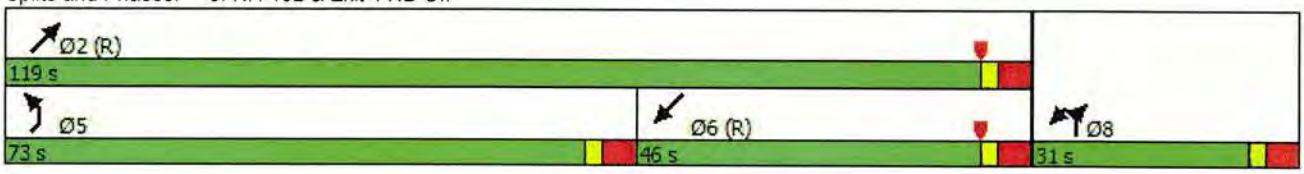
Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	485	0	245	0	0	1415	250	0	0	820	500
Future Volume (vph)	485	0	245	0	0	1415	250	0	0	820	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0	0	0	550		0	0		0
Storage Lanes		2	2	0	0	2		0	0		1
Taper Length (ft)		25		25		25			25		
Lane Util. Factor	0.97	1.00	0.88	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt			0.850								0.850
Flt Protected	0.950					0.950					
Satd. Flow (prot)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Flt Permitted	0.950					0.950					
Satd. Flow (perm)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Right Turn on Red			No					Yes			Yes
Satd. Flow (RTOR)											306
Link Speed (mph)		25		30			30			30	
Link Distance (ft)		856		390			760			857	
Travel Time (s)		23.3		8.9			17.3			19.5	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Adj. Flow (vph)	551	0	278	0	0	1505	266	0	0	891	543
Shared Lane Traffic (%)											
Lane Group Flow (vph)	551	0	278	0	0	1505	266	0	0	891	543
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		24		0			24			24	
Link Offset(ft)		12		0			0			0	
Crosswalk Width(ft)		16		16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	25	15	9	15		9	15		25
Number of Detectors	3		3			3	3			3	0
Detector Template											
Leading Detector (ft)	256		256			256	256			256	0
Trailing Detector (ft)	-5		-5			-5	-5			-5	0
Detector 1 Position(ft)	-5		-5			-5	-5			-5	-5
Detector 1 Size(ft)	55		55			55	55			55	50
Detector 1 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Queue (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Delay (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 2 Position(ft)	125		125			125	125			125	
Detector 2 Size(ft)	6		6			6	6			6	
Detector 2 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	
Detector 2 Channel											
Detector 2 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Detector 3 Position(ft)	250		250			250	250			250	
Detector 3 Size(ft)	6		6			6	6			6	

Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	
Detector 3 Channel											
Detector 3 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Detector Phase	8		2			5	2			6	
Switch Phase											
Minimum Initial (s)	10.0		10.0			5.0	8.0			8.0	
Minimum Split (s)	16.0		16.0			11.0	42.0			31.0	
Total Split (s)	31.0		31.0			73.0	119.0			46.0	
Total Split (%)	20.7%		20.7%			48.7%	79.3%			30.7%	
Maximum Green (s)	25.0		25.0			67.0	113.0			40.0	
Yellow Time (s)	2.0		2.0			2.0	2.0			2.0	
All-Red Time (s)	4.0		4.0			4.0	4.0			4.0	
Lost Time Adjust (s)	0.0		0.0			0.0	0.0			0.0	
Total Lost Time (s)	6.0		6.0			6.0	6.0			6.0	
Lead/Lag						Lead				Lag	
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Recall Mode	None		None			None	C-Min			C-Min	
Walk Time (s)							7.0			7.0	
Flash Dont Walk (s)							29.0			17.0	
Pedestrian Calls (#/hr)							0			0	
Act Effct Green (s)	25.0		25.0			67.0	113.0			40.0	150.0
Actuated g/C Ratio	0.17		0.17			0.45	0.75			0.27	1.00
v/c Ratio	1.02		0.63			1.01	0.10			0.95	0.35
Control Delay	104.4		65.6			51.1	9.0			74.0	0.6
Queue Delay	0.0		0.0			0.0	0.0			0.0	0.0
Total Delay	104.4		65.6			51.1	9.0			74.0	0.6
LOS	F		E			D	A			E	A
Approach Delay		91.3					44.7			46.2	
Approach LOS		F					D			D	
Queue Length 50th (ft)	~293		146			~706	51			454	0
Queue Length 95th (ft)	#398		197			m#903	m57			#588	0
Internal Link Dist (ft)		776		310			680			777	
Turn Bay Length (ft)						550					
Base Capacity (vph)	540		438			1489	2589			934	1568
Starvation Cap Reductn	0		0			0	0			0	0
Spillback Cap Reductn	0		0			0	0			0	0
Storage Cap Reductn	0		0			0	0			0	0
Reduced v/c Ratio	1.02		0.63			1.01	0.10			0.95	0.35

Intersection Summary	
Area Type:	Other
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 147 (98%), Referenced to phase 2:NET and 6:SWT, Start of Yellow	
Natural Cycle: 130	

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 54.9 Intersection LOS: D
Intersection Capacity Utilization 92.9% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: NH 102 & Exit 4 NB Off



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	690	420	260	730	0	0	0	0	105	0	385
Future Volume (vph)	0	690	420	260	730	0	0	0	0	105	0	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		350	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3167	1417	1687	3374	0	0	0	0	3303	0	1524
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	3167	1417	1687	3374	0	0	0	0	3303	0	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			457									110
Link Speed (mph)		30			30			30			35	
Link Distance (ft)		851			693			486			581	
Travel Time (s)		19.3			15.8			11.0			11.3	
Peak Hour Factor	0.92	0.92	0.92	0.73	0.73	0.73	0.92	0.92	0.92	0.74	0.74	0.74
Heavy Vehicles (%)	14%	14%	14%	7%	7%	7%	2%	2%	2%	6%	6%	6%
Adj. Flow (vph)	0	750	457	356	1000	0	0	0	0	142	0	520
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	750	457	356	1000	0	0	0	0	142	0	520
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Right
Median Width(ft)		36			36			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		25	15		9	15		9	15		9
Number of Detectors		3	2	3	3					3		2
Detector Template		Thru	Right	Left	Thru					Left		
Leading Detector (ft)		256	131	256	256					256		206
Trailing Detector (ft)		-5	-5	-5	-5					-5		-5
Detector 1 Position(ft)		-5	-5	-5	-5					-5		-5
Detector 1 Size(ft)		50	50	50	50					50		50
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 2 Position(ft)		125	125	125	125					125		200
Detector 2 Size(ft)		6	6	6	6					6		6
Detector 2 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 3 Position(ft)		250		250	250					250		
Detector 3 Size(ft)		6		6	6					6		

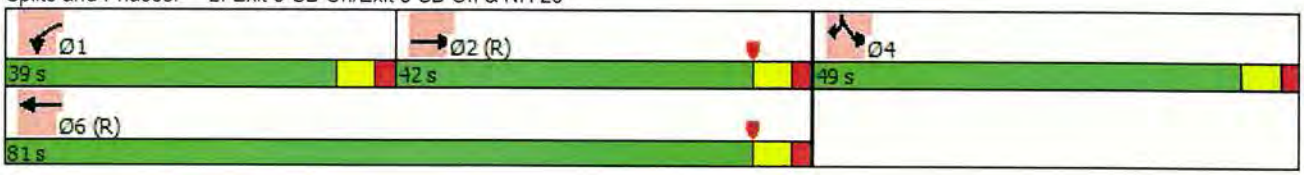
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 3 Type		Cl+Ex		Cl+Ex	Cl+Ex					Cl+Ex		
Detector 3 Channel												
Detector 3 Extend (s)		0.0		0.0	0.0					0.0		
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Detector Phase		2		1	6					4		4
Switch Phase												
Minimum Initial (s)		9.0		4.0	9.0					4.0		4.0
Minimum Split (s)		21.0		10.0	21.0					10.0		10.0
Total Split (s)		42.0		39.0	81.0					49.0		49.0
Total Split (%)		32.3%		30.0%	62.3%					37.7%		37.7%
Maximum Green (s)		36.0		33.0	75.0					43.0		43.0
Yellow Time (s)		4.0		4.0	4.0					4.0		4.0
All-Red Time (s)		2.0		2.0	2.0					2.0		2.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0					6.0		6.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Recall Mode		C-Min		None	C-Min					None		None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		8.0			8.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)		40.3	130.0	30.7	77.0					41.0		41.0
Actuated g/C Ratio		0.31	1.00	0.24	0.59					0.32		0.32
v/c Ratio		0.76	0.32	0.89	0.50					0.14		0.94
Control Delay		47.8	0.6	39.7	2.8					31.5		59.3
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		47.8	0.6	39.7	2.8					31.5		59.3
LOS		D	A	D	A					C		E
Approach Delay		30.0			12.5						53.3	
Approach LOS		C			B						D	
Queue Length 50th (ft)		316	0	255	53					43		343
Queue Length 95th (ft)		#404	0	m142	39					55		356
Internal Link Dist (ft)		771			613			406			501	
Turn Bay Length (ft)			350									
Base Capacity (vph)		981	1417	428	1998					1092		577
Starvation Cap Reductn		0	0	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.76	0.32	0.83	0.50					0.13		0.90

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 75 (58%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 80

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 27.4 Intersection LOS: C
Intersection Capacity Utilization 76.3% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Exit 5 SB On/Exit 5 SB Off & NH 28



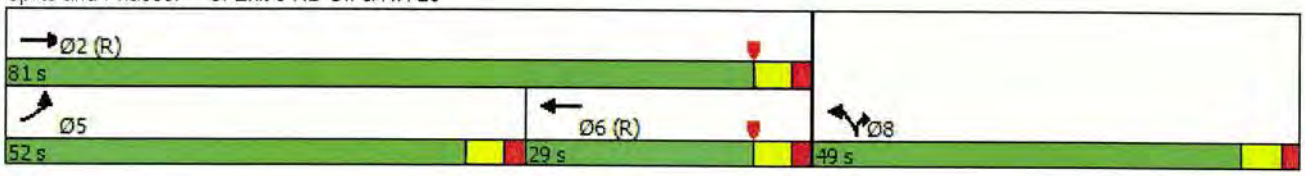
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	525	270	0	0	545	570	445	0	165	0	0	0
Future Volume (vph)	525	270	0	0	545	570	445	0	165	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1641	3282	0	0	3438	1538	1656	0	1482	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1641	3282	0	0	3438	1538	1656	0	1482	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						604			169			
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		693			542			867			392	
Travel Time (s)		15.8			12.3			16.9			8.9	
Peak Hour Factor	0.87	0.87	0.87	0.90	0.90	0.90	0.78	0.78	0.78	0.92	0.92	0.92
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	9%	9%	9%	2%	2%	2%
Adj. Flow (vph)	603	310	0	0	606	633	571	0	212	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	603	310	0	0	606	633	571	0	212	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Right	Right	Left	Right	Left	Left	Right
Median Width(ft)		36			42			12			12	
Link Offset(ft)		0			0			0			36	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		25	15		9	15		9
Number of Detectors	3	3			3	2	3		0			
Detector Template	Left	Thru			Thru	Right	Left					
Leading Detector (ft)	256	256			256	131	256		0			
Trailing Detector (ft)	-5	-5			-5	-5	-5		0			
Detector 1 Position(ft)	-5	-5			-5	-5	-5		-5			
Detector 1 Size(ft)	50	50			50	50	50		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 2 Position(ft)	125	125			125	125	125					
Detector 2 Size(ft)	6	6			6	6	6					
Detector 2 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex					
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0			0.0	0.0	0.0					
Detector 3 Position(ft)	250	250			250		250					
Detector 3 Size(ft)	6	6			6		6					
Detector 3 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex					
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0			0.0		0.0					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Detector Phase	5	2			6		8		8			
Switch Phase												
Minimum Initial (s)	4.0	16.0			16.0		4.0		4.0			
Minimum Split (s)	10.0	23.0			23.0		10.0		10.0			
Total Split (s)	52.0	81.0			29.0		49.0		49.0			
Total Split (%)	40.0%	62.3%			22.3%		37.7%		37.7%			
Maximum Green (s)	46.0	75.0			23.0		43.0		43.0			
Yellow Time (s)	4.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	2.0	2.0			2.0		2.0		2.0			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.0		6.0		6.0			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		10.0			10.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	46.0	75.0			23.0	130.0	43.0		43.0			
Actuated g/C Ratio	0.35	0.58			0.18	1.00	0.33		0.33			
v/c Ratio	1.04	0.16			1.00	0.41	1.04		0.35			
Control Delay	55.8	2.7			89.0	0.8	92.8		9.7			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	55.8	2.7			89.0	0.8	92.8		9.7			
LOS	E	A			F	A	F		A			
Approach Delay		37.8			43.9			70.3				
Approach LOS		D			D			E				
Queue Length 50th (ft)	~534	5			271	0	~520		25			
Queue Length 95th (ft)	#684	7			#398	0	#583		57			
Internal Link Dist (ft)		613			462			787			312	
Turn Bay Length (ft)												
Base Capacity (vph)	580	1893			608	1538	547		603			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.04	0.16			1.00	0.41	1.04		0.35			

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 49.1	Intersection LOS: D

Intersection Capacity Utilization 76.3% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Exit 5 NB Off & NH 28



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	0	150	0	1	0	60	410	0	5	1030	20
Future Volume (vph)	10	0	150	0	1	0	60	410	0	5	1030	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		225	0		0	350		0	100		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850								0.997	
Flt Protected		0.950					0.950			0.950		
Satd. Flow (prot)	0	1770	1583	0	1900	0	1770	3539	0	1770	3529	0
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	1863	1583	0	1900	0	1770	3539	0	1770	3529	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182								3	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		593			447			750			330	
Travel Time (s)		13.5			10.2			17.0			7.5	
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	11	0	163	0	4	0	65	446	0	5	1120	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	11	163	0	4	0	65	446	0	5	1142	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	3	1	3	1		3	3		3	3	
Detector Template	Left	Thru	Right	Left			Left	Thru		Left	Thru	
Leading Detector (ft)	256	256	45	256	45		256	256		256	256	
Trailing Detector (ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Position(ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	125	125		125			125	125		125	125	
Detector 2 Size(ft)	6	6		6			6	6		6	6	
Detector 2 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Detector 3 Position(ft)	250	250		250			250	250		250	250	
Detector 3 Size(ft)	6	6		6			6	6		6	6	

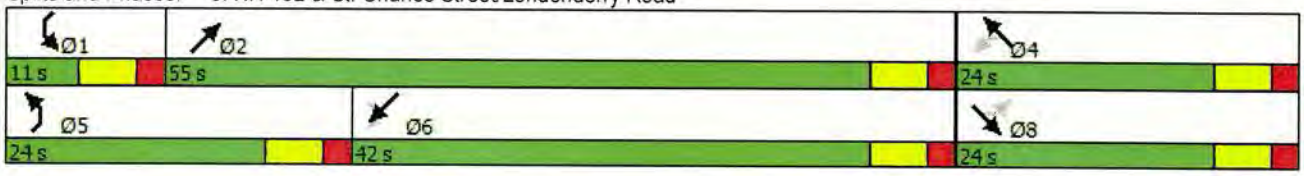
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	custom		NA		Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Detector Phase	8	8	6	4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	8.0	5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		24.0	24.0		11.0	24.0	
Total Split (s)	24.0	24.0	42.0	24.0	24.0		24.0	55.0		11.0	42.0	
Total Split (%)	26.7%	26.7%	46.7%	26.7%	26.7%		26.7%	61.1%		12.2%	46.7%	
Maximum Green (s)	18.0	18.0	36.0	18.0	18.0		18.0	49.0		5.0	36.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lead/Lag			Lag				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	Min	None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0			0	
Act Effct Green (s)		6.3	43.5		6.2		7.9	55.9		5.2	43.5	
Actuated g/C Ratio		0.10	0.71		0.10		0.13	0.91		0.09	0.71	
v/c Ratio		0.06	0.14		0.02		0.29	0.14		0.03	0.45	
Control Delay		27.3	1.6		27.0		29.0	2.4		29.0	7.4	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		27.3	1.6		27.0		29.0	2.4		29.0	7.4	
LOS		C	A		C		C	A		C	A	
Approach Delay		3.2			27.0			5.8			7.5	
Approach LOS		A			C			A			A	
Queue Length 50th (ft)		4	0		1		23	0		2	85	
Queue Length 95th (ft)		19	22		3		60	67		12	248	
Internal Link Dist (ft)		513			367			670			250	
Turn Bay Length (ft)			225				350			100		
Base Capacity (vph)		567	1178		578		538	3313		149	2511	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.02	0.14		0.01		0.12	0.13		0.03	0.45	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 61.1
Natural Cycle: 80
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.45
Intersection Signal Delay: 6.6 Intersection LOS: A
Intersection Capacity Utilization 61.4% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 9: NH 102 & St. Charles Street/Londonderry Road



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	50	0	350	0	40	0	360	110	15	545	0
Future Volume (vph)	10	50	0	350	0	40	0	360	110	15	545	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.986			0.968				
Flt Protected		0.992			0.957						0.999	
Satd. Flow (prot)	0	1848	0	0	1741	0	0	1703	0	0	1808	0
Flt Permitted		0.910			0.678						0.982	
Satd. Flow (perm)	0	1695	0	0	1233	0	0	1703	0	0	1777	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					36			24				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		356			493			1124			603	
Travel Time (s)		8.1			11.2			25.5			13.7	
Peak Hour Factor	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Adj. Flow (vph)	17	83	0	365	0	42	0	404	124	17	634	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	100	0	0	407	0	0	528	0	0	651	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		-22			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	1		3	2			2		3	2	
Detector Template	Left			Left						Left		
Leading Detector (ft)	256	45		256	131			131		256	131	
Trailing Detector (ft)	-5	-5		-5	-5			-5		-5	-5	
Detector 1 Position(ft)	-5	-5		-5	-5			-5		-5	-5	
Detector 1 Size(ft)	50	50		50	50			50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 2 Position(ft)	125			125	125			125		125	125	
Detector 2 Size(ft)	6			6	6			6		6	6	
Detector 2 Type	Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0	0.0			0.0		0.0	0.0	
Detector 3 Position(ft)	250			250						250		
Detector 3 Size(ft)	6			6						6		
Detector 3 Type	Cl+Ex			Cl+Ex						Cl+Ex		
Detector 3 Channel												
Detector 3 Extend (s)	0.0			0.0						0.0		

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Detector Phase	4	4		4	4			2		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0			24.0		24.0	24.0	
Total Split (s)	41.0	41.0		41.0	41.0			49.0		49.0	49.0	
Total Split (%)	45.6%	45.6%		45.6%	45.6%			54.4%		54.4%	54.4%	
Maximum Green (s)	35.0	35.0		35.0	35.0			43.0		43.0	43.0	
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Recall Mode	None	None		None	None			Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		28.5			28.5			36.1			36.1	
Actuated g/C Ratio		0.37			0.37			0.47			0.47	
v/c Ratio		0.16			0.86			0.65			0.78	
Control Delay		18.5			40.4			20.3			26.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		18.5			40.4			20.3			26.2	
LOS		B			D			C			C	
Approach Delay		18.5			40.4			20.3			26.2	
Approach LOS		B			D			C			C	
Queue Length 50th (ft)		36			187			203			288	
Queue Length 95th (ft)		45			#351			312			404	
Internal Link Dist (ft)		276			413			1044			523	
Turn Bay Length (ft)												
Base Capacity (vph)		813			610			1014			1048	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.12			0.67			0.52			0.62	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 77.3			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 27.3		Intersection LOS: C	
Intersection Capacity Utilization 80.6%		ICU Level of Service D	

Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: NH 102 & Fordway/Madden Hill Road

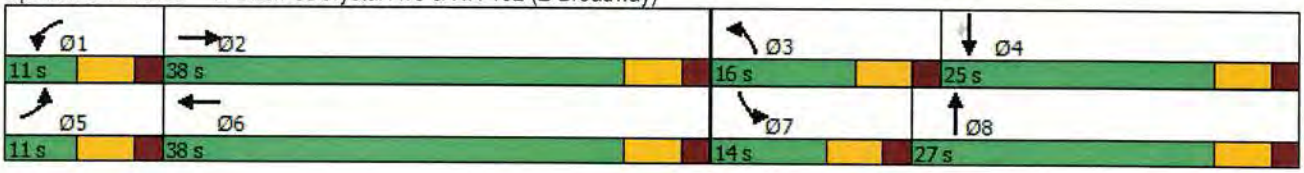
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	220	60	20	340	190	150	200	20	60	260	20
Future Volume (vph)	70	220	60	20	340	190	150	200	20	60	260	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	390		0	110		0	70		0	245		245
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.968			0.946			0.986				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1687	0	1703	1696	0	1719	1784	0	1703	1792	1524
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1656	1687	0	1703	1696	0	1719	1784	0	1703	1792	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			35			5				182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		505			530			361			411	
Travel Time (s)		11.5			12.0			8.2			9.3	
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.91	0.91	0.91
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	5%	5%	5%	6%	6%	6%
Parking (#/hr)			0									
Adj. Flow (vph)	73	229	63	21	362	202	176	235	24	66	286	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	292	0	21	564	0	176	259	0	66	286	22
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Detector Phase	5	2		1	6		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	10.0		4.0	10.0		4.0	9.0	9.0
Minimum Split (s)	10.0	30.0		10.0	30.0		10.0	25.0		10.0	25.0	25.0
Total Split (s)	11.0	38.0		11.0	38.0		16.0	27.0		14.0	25.0	25.0
Total Split (%)	12.2%	42.2%		12.2%	42.2%		17.8%	30.0%		15.6%	27.8%	27.8%
Maximum Green (s)	5.0	32.0		5.0	32.0		10.0	21.0		8.0	19.0	19.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Min		None	Min		Min	None		Min	None	None
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)		10			10			0			10	10
Act Effct Green (s)	5.1	33.6		5.1	29.4		10.3	19.8		7.4	16.9	16.9
Actuated g/C Ratio	0.06	0.40		0.06	0.35		0.12	0.24		0.09	0.20	0.20
v/c Ratio	0.72	0.42		0.20	0.91		0.83	0.61		0.44	0.79	0.05
Control Delay	79.9	20.4		45.4	45.8		71.2	36.5		48.5	49.8	0.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	79.9	20.4		45.4	45.8		71.2	36.5		48.5	49.8	0.2
LOS	E	C		D	D		E	D		D	D	A
Approach Delay		32.3			45.8			50.5			46.7	
Approach LOS		C			D			D			D	
Queue Length 50th (ft)	42	94		12	285		101	130		36	154	0
Queue Length 95th (ft)	#120	195		35	#487		#205	196		78	#271	0
Internal Link Dist (ft)		425			450			281			331	
Turn Bay Length (ft)	390			110			70			245		245
Base Capacity (vph)	102	758		104	691		212	466		168	420	496
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.72	0.39		0.20	0.82		0.83	0.56		0.39	0.68	0.04

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 83.3
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 44.3 Intersection LOS: D
Intersection Capacity Utilization 75.4% ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Birch St/Crystal Ave & NH 102 (E Broadway)



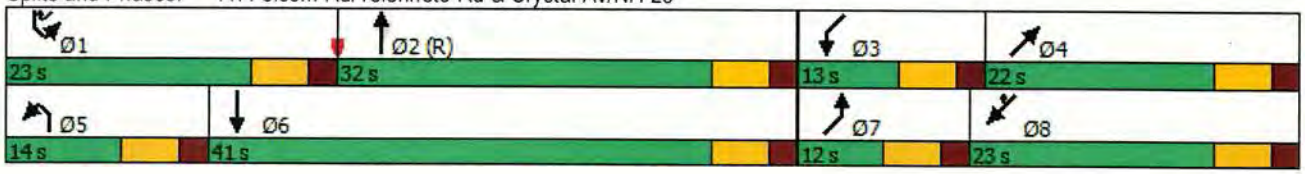
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	200	120	375	200	0	30	165	20	40	225	595
Future Volume (vph)	20	200	120	375	200	0	30	165	20	40	225	595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		90	360		0	190		180	0		210
Storage Lanes	1		1	2		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	3471	1553	3335	3438	0	1752	1845	1568	1752	1845	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	3471	1553	3335	3438	0	1752	1845	1568	1752	1845	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			255						327			409
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		639			546			532			387	
Travel Time (s)		14.5			12.4			12.1			8.8	
Peak Hour Factor	0.84	0.84	0.84	0.79	0.79	0.79	0.86	0.86	0.86	0.99	0.99	0.99
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	24	238	143	475	253	0	35	192	23	40	227	601
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	238	143	475	253	0	35	192	23	40	227	601
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	5	2		1	6		7	4		3	8	8 1
Permitted Phases		2	2		6			4	Free		8	
Detector Phase	5	2	2	1	6		7	4		3	8	8 1
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		6.0	8.0		7.0	8.0	
Minimum Split (s)	14.0	31.0	31.0	14.0	40.0		12.0	21.0		13.0	21.0	
Total Split (s)	14.0	32.0	32.0	23.0	41.0		12.0	22.0		13.0	23.0	
Total Split (%)	15.6%	35.6%	35.6%	25.6%	45.6%		13.3%	24.4%		14.4%	25.6%	
Maximum Green (s)	8.0	26.0	26.0	17.0	35.0		6.0	16.0		7.0	17.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	C-Max	C-Max	None	Max		None	None		None	None	
Walk Time (s)		5.0	5.0		5.0			5.0			5.0	
Flash Dont Walk (s)		10.0	10.0		10.0			10.0			10.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effct Green (s)	14.2	32.9	32.9	16.3	35.0		6.0	15.0	90.0	7.0	15.6	37.9
Actuated g/C Ratio	0.16	0.37	0.37	0.18	0.39		0.07	0.17	1.00	0.08	0.17	0.42
v/c Ratio	0.09	0.19	0.20	0.79	0.19		0.30	0.63	0.01	0.29	0.71	0.67
Control Delay	38.4	22.3	0.6	40.0	17.3		47.2	44.3	0.0	45.2	47.8	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	38.4	22.3	0.6	40.0	17.3		47.2	44.3	0.0	45.2	47.8	10.0
LOS	D	C	A	D	B		D	D	A	D	D	B
Approach Delay		15.6			32.1			40.6			21.5	
Approach LOS		B			C			D			C	
Queue Length 50th (ft)	13	54	0	136	54		19	101	0	22	121	68
Queue Length 95th (ft)	35	78	0	139	68		47	162	0	54	198	184
Internal Link Dist (ft)		559			466			452			307	
Turn Bay Length (ft)	110		90	360			190		180			210
Base Capacity (vph)	273	1269	729	629	1337		116	328	1568	136	348	893
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.19	0.20	0.76	0.19		0.30	0.59	0.01	0.29	0.65	0.67

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 26.0 — Intersection LOS: C
Intersection Capacity Utilization 63.5% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 11: Folsom Rd/Tsienneto Rd & Crystal Av/NH 28



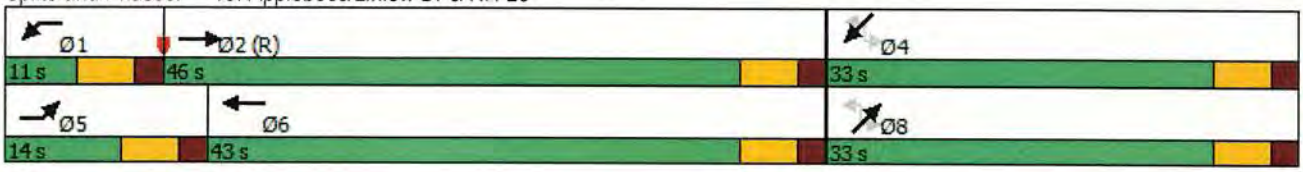
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	790	0	0	680	30	5	0	5	10	0	70
Future Volume (vph)	10	790	0	0	680	30	5	0	5	10	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	115		0	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.994				0.850			0.850
Flt Protected	0.950							0.950			0.950	
Satd. Flow (prot)	1687	3374	0	1863	3518	0	0	1805	1615	0	1787	1599
Flt Permitted	0.950							0.755			0.755	
Satd. Flow (perm)	1687	3374	0	1863	3518	0	0	1434	1615	0	1420	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					6				109			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		277			601			218			433	
Travel Time (s)		6.3			13.7			5.0			9.8	
Peak Hour Factor	0.83	0.83	0.83	0.92	0.92	0.92	0.50	0.50	0.50	0.90	0.90	0.90
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	12	952	0	0	739	33	10	0	10	11	0	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	952	0	0	772	0	0	10	10	0	11	78
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases					6		8	8	8	4		4
Detector Phase	5	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	46.0		11.0	43.0		33.0	33.0	33.0	33.0	33.0	33.0
Total Split (s)	14.0	46.0		11.0	43.0		33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	15.6%	51.1%		12.2%	47.8%		36.7%	36.7%	36.7%	36.7%	36.7%	36.7%
Maximum Green (s)	8.0	40.0		5.0	37.0		27.0	27.0	27.0	27.0	27.0	27.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
Act Effct Green (s)	8.0	75.1			72.3			6.4	6.4		6.4	6.4
Actuated g/C Ratio	0.09	0.83			0.80			0.07	0.07		0.07	0.07
v/c Ratio	0.08	0.34			0.27			0.10	0.05		0.11	0.36
Control Delay	45.5	2.6			4.7			40.6	0.4		41.0	8.8
Queue Delay	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Delay	45.5	2.6			4.7			40.6	0.4		41.0	8.8
LOS	D	A			A			D	A		D	A
Approach Delay		3.1			4.7			20.5			12.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		A			A			C			B	
Queue Length 50th (ft)	6	81			82			6	0		6	0
Queue Length 95th (ft)	m14	61			140			12	0		22	24
Internal Link Dist (ft)		197			521			138			353	
Turn Bay Length (ft)	100											
Base Capacity (vph)	149	2816			2829			430	560		426	556
Starvation Cap Reductn	0	0			0			0	0		0	0
Spillback Cap Reductn	0	0			0			0	0		0	0
Storage Cap Reductn	0	0			0			0	0		0	0
Reduced v/c Ratio	0.08	0.34			0.27			0.02	0.02		0.03	0.14

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 63 (70%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.36
Intersection Signal Delay: 4.4 Intersection LOS: A
Intersection Capacity Utilization 45.2% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Applebees/Linlew Dr & NH 28



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	140	100	630	230	20	100	500	730	20	420	140
Future Volume (vph)	40	140	100	630	230	20	100	500	730	20	420	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	220		0	100		265	200		0
Storage Lanes	1		1	2		0	1		2	1		1
Taper Length (ft)	200			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	0.95	0.95	1.00	0.95	0.88	1.00	0.95	1.00
Frt			0.850		0.988				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	1792	1524	3367	3429	0	1805	3610	2842	1752	3505	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1703	1792	1524	3367	3429	0	1805	3610	2842	1752	3505	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109		10				754			156
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		412			486			387			343	
Travel Time (s)		9.4			11.0			8.8			7.8	
Peak Hour Factor	0.83	0.83	0.83	0.97	0.97	0.97	0.67	0.67	0.67	0.90	0.90	0.90
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Adj. Flow (vph)	48	169	120	649	237	21	149	746	1090	22	467	156
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	169	120	649	258	0	149	746	1090	22	467	156
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6		3	8	1	7	4	5
Permitted Phases			2						8		4	4
Detector Phase	5	2	3	1	6		3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	8.0	8.0	5.0	8.0	8.0		5.0	5.0	8.0	5.0	8.0	8.0
Minimum Split (s)	22.0	22.0	11.0	22.0	22.0		11.0	22.0	22.0	11.0	22.0	22.0
Total Split (s)	22.0	24.0	16.0	27.0	29.0		16.0	28.0	27.0	11.0	23.0	22.0
Total Split (%)	24.4%	26.7%	17.8%	30.0%	32.2%		17.8%	31.1%	30.0%	12.2%	25.6%	24.4%
Maximum Green (s)	16.0	18.0	10.0	21.0	23.0		10.0	22.0	21.0	5.0	17.0	16.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Min	C-Min	None	Min	Min		None	None	Min	None	None	Min
Walk Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effct Green (s)	8.8	17.6	34.6	21.6	30.4		11.0	28.0	55.6	6.0	15.8	30.6
Actuated g/C Ratio	0.10	0.20	0.38	0.24	0.34		0.12	0.31	0.62	0.07	0.18	0.34
v/c Ratio	0.29	0.48	0.18	0.81	0.22		0.67	0.66	0.53	0.19	0.76	0.25
Control Delay	42.0	38.3	5.5	41.4	19.6		54.5	31.6	4.0	43.9	43.8	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	42.0	38.3	5.5	41.4	19.6		54.5	31.6	4.0	43.9	43.8	4.4
LOS	D	D	A	D	B		D	C	A	D	D	A
Approach Delay		27.2			35.2			18.2			34.3	
Approach LOS		C			D			B			C	
Queue Length 50th (ft)	26	91	4	133	37		80	164	29	12	132	0
Queue Length 95th (ft)	54	134	31	#276	62		106	193	30	36	185	38
Internal Link Dist (ft)		332			406			307			263	
Turn Bay Length (ft)	100			220			100		265	200		
Base Capacity (vph)	302	385	658	813	1164		227	1123	2047	116	662	748
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.44	0.18	0.80	0.22		0.66	0.66	0.53	0.19	0.71	0.21

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 25.6 Intersection LOS: C
Intersection Capacity Utilization 63.3% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 22: Connector Road & NH 28

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	50	20	20	40	100	10	140	70	65	330	65
Future Volume (vph)	30	50	20	20	40	100	10	140	70	65	330	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		150	190		190	135		150	120		150
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.958				0.850		0.950			0.975	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1767	0	1736	1827	1553	1770	1770	0	1787	1834	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1767	0	1736	1827	1553	1770	1770	0	1787	1834	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21				123		33			13	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		481			347			479			371	
Travel Time (s)		10.9			7.9			10.9			8.4	
Peak Hour Factor	0.82	0.82	0.82	0.81	0.81	0.81	0.68	0.68	0.68	0.78	0.78	0.78
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	37	61	24	25	49	123	15	206	103	83	423	83
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	85	0	25	49	123	15	309	0	83	506	0
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases												
Detector Phase	1	6		5	2	2 3	3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	20.0		14.0	20.0		14.0	20.0		14.0	20.0	
Total Split (s)	14.0	20.0		14.0	20.0		14.0	31.0		15.0	32.0	
Total Split (%)	17.5%	25.0%		17.5%	25.0%		17.5%	38.8%		18.8%	40.0%	
Maximum Green (s)	8.0	14.0		8.0	14.0		8.0	25.0		9.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	C-Max		None	None		None	None	
Act Effct Green (s)	8.0	26.8		8.0	24.0	38.0	8.0	23.8		8.6	24.4	
Actuated g/C Ratio	0.10	0.34		0.10	0.30	0.48	0.10	0.30		0.11	0.30	
v/c Ratio	0.21	0.14		0.14	0.09	0.15	0.08	0.56		0.43	0.89	
Control Delay	36.4	20.8		35.1	27.7	4.3	34.0	25.3		40.8	45.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	36.4	20.8		35.1	27.7	4.3	34.0	25.3		40.8	45.7	
LOS	D	C		D	C	A	C	C		D	D	
Approach Delay		25.5			14.0			25.7			45.0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		C			B			C			D	
Queue Length 50th (ft)	17	21		12	21	0	7	112		39	226	
Queue Length 95th (ft)	41	59		31	45	25	18	129		71	282	
Internal Link Dist (ft)		401			267			399			291	
Turn Bay Length (ft)	200			190		190	135			120		
Base Capacity (vph)	175	606		173	548	803	177	575		201	604	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.21	0.14		0.14	0.09	0.15	0.08	0.54		0.41	0.84	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 33.1 Intersection LOS: C
Intersection Capacity Utilization 51.3% ICU Level of Service A
Analysis Period (min) 15

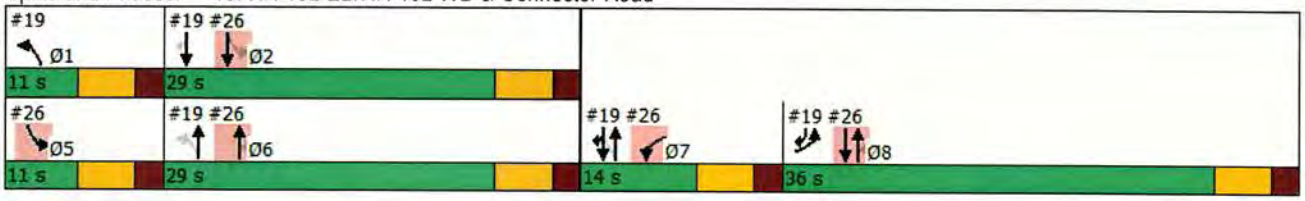
Splits and Phases: 18: Tsienneto Rd & NH 28 Byp N

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø2	Ø5	Ø6	Ø7
Lane Configurations										
Traffic Volume (vph)	510	10	20	70	140	600				
Future Volume (vph)	510	10	20	70	140	600				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	0	0	120			90				
Storage Lanes	1	0	1			1				
Taper Length (ft)	25		25							
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Frt	0.997					0.850				
Flt Protected	0.953		0.950							
Satd. Flow (prot)	1770	0	1626	1712	1863	1583				
Flt Permitted	0.953		0.630							
Satd. Flow (perm)	1770	0	1078	1712	1863	1583				
Right Turn on Red		Yes				Yes				
Satd. Flow (RTOR)	1					732				
Link Speed (mph)	30			30	30					
Link Distance (ft)	472			739	258					
Travel Time (s)	10.7			16.8	5.9					
Peak Hour Factor	0.94	0.94	0.91	0.91	0.82	0.82				
Heavy Vehicles (%)	2%	2%	11%	11%	2%	2%				
Adj. Flow (vph)	543	11	22	77	171	732				
Shared Lane Traffic (%)										
Lane Group Flow (vph)	554	0	22	77	171	732				
Turn Type	Prot		pm+pt	NA	NA	custom				
Protected Phases	8		1	6 7	2 7	7 8	2	5	6	7
Permitted Phases			6 7			2				
Detector Phase	8		1	6 7	2 7	7 8				
Switch Phase										
Minimum Initial (s)	5.0		5.0				5.0	5.0	5.0	5.0
Minimum Split (s)	26.5		11.0				28.0	11.0	28.0	11.0
Total Split (s)	36.0		11.0				29.0	11.0	29.0	14.0
Total Split (%)	40.0%		12.2%				32%	12%	32%	16%
Maximum Green (s)	30.0		5.0				23.0	5.0	23.0	8.0
Yellow Time (s)	4.0		4.0				4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0				2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0							
Total Lost Time (s)	6.0		6.0							
Lead/Lag	Lag		Lead				Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes		Yes				Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0		3.0				3.0	3.0	3.0	3.0
Recall Mode	None		None				Min	None	Min	None
Walk Time (s)							7.0		7.0	
Flash Dont Walk (s)							15.0		15.0	
Pedestrian Calls (#/hr)							0		0	
Act Effct Green (s)	30.6		31.6	30.7	28.9	69.7				
Actuated g/C Ratio	0.41		0.42	0.41	0.38	0.92				
v/c Ratio	0.77		0.05	0.11	0.24	0.48				
Control Delay	31.6		11.1	14.4	19.2	1.2				
Queue Delay	0.0		0.0	0.0	1.1	0.1				

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø2	Ø5	Ø6	Ø7
Total Delay	31.6		11.1	14.4	20.3	1.2				
LOS	C		B	B	C	A				
Approach Delay	31.6			13.7	4.9					
Approach LOS	C			B	A					
Queue Length 50th (ft)	183		6	20	54	2				
Queue Length 95th (ft)	#509		17	54	92	0				
Internal Link Dist (ft)	392			659	178					
Turn Bay Length (ft)			120			90				
Base Capacity (vph)	719		488	701	700	1502				
Starvation Cap Reductn	0		0	0	342	104				
Spillback Cap Reductn	0		0	0	0	0				
Storage Cap Reductn	0		0	0	0	0				
Reduced v/c Ratio	0.77		0.05	0.11	0.48	0.52				

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 75.5			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 15.0		Intersection LOS: B	
Intersection Capacity Utilization 55.4%		ICU Level of Service B	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 19: NH 102 EB/NH 102 WB & Connector Road



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	⇈				⇈	
Traffic Volume (vph)	1135	0	0	0	1770	0
Future Volume (vph)	1135	0	0	0	1770	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	1.00	0.97	1.00
Frt						
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3433	0	0	0	3433	0
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3433	0	0	0	3433	0
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (mph)	30		30			30
Link Distance (ft)	372		529			557
Travel Time (s)	8.5		12.0			12.7
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1207	0	0	0	1883	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1207	0	0	0	1883	0
Turn Type	Prot				Prot	
Protected Phases	2				4	
Permitted Phases						
Detector Phase	2				4	
Switch Phase						
Minimum Initial (s)	5.0				9.0	
Minimum Split (s)	24.0				24.0	
Total Split (s)	37.0				53.0	
Total Split (%)	41.1%				58.9%	
Maximum Green (s)	31.0				47.0	
Yellow Time (s)	4.0				4.0	
All-Red Time (s)	2.0				2.0	
Lost Time Adjust (s)	0.0				0.0	
Total Lost Time (s)	6.0				6.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0				3.0	
Recall Mode	C-Max				Max	
Act Effct Green (s)	31.0				47.0	
Actuated g/C Ratio	0.34				0.52	
v/c Ratio	1.02				1.05	
Control Delay	47.0				58.9	
Queue Delay	0.0				22.6	
Total Delay	47.0				81.5	
LOS	D				F	
Approach Delay	47.0					81.5
Approach LOS	D					F
Queue Length 50th (ft)	~366				~607	
Queue Length 95th (ft)	#508				#742	
Internal Link Dist (ft)	292		449			477

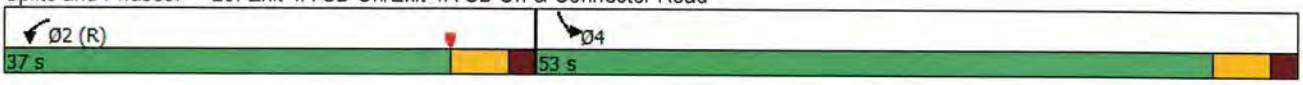
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Bay Length (ft)						
Base Capacity (vph)	1182				1792	
Starvation Cap Reductn	0				0	
Spillback Cap Reductn	0				841	
Storage Cap Reductn	0				0	
Reduced v/c Ratio	1.02				1.98	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 5 (6%), Referenced to phase 2:WBL, Start of Yellow			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.05			
Intersection Signal Delay: 68.0		Intersection LOS: E	
Intersection Capacity Utilization 143.4%		ICU Level of Service H	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 20: Exit 4A SB On/Exit 4A SB Off & Connector Road

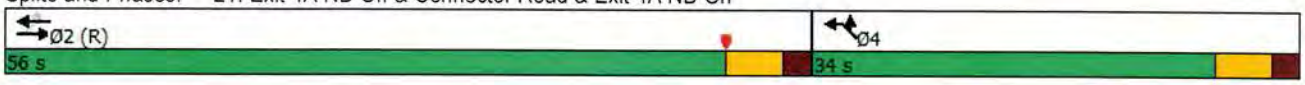


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations										
Traffic Volume (vph)	0	1770	0	0	1135	1205	0	0	0	865
Future Volume (vph)	0	1770	0	0	1135	1205	0	0	0	865
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	0		200	0	0	0	0
Storage Lanes	1		0	0		2	0	0	1	1
Taper Length (ft)	75			25			25		25	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.88	1.00	1.00	1.00	0.95
Frt						0.850			0.850	0.850
Flt Protected										
Satd. Flow (prot)	1863	3539	0	0	3539	2787	0	0	1583	1504
Flt Permitted										
Satd. Flow (perm)	1863	3539	0	0	3539	2787	0	0	1583	1504
Right Turn on Red			Yes			Yes		Yes		
Satd. Flow (RTOR)						36				
Link Speed (mph)		30			30		30		30	
Link Distance (ft)		372			394		598		519	
Travel Time (s)		8.5			9.0		13.6		11.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1883	0	0	1207	1282	0	0	0	920
Shared Lane Traffic (%)										50%
Lane Group Flow (vph)	0	1883	0	0	1207	1282	0	0	460	460
Turn Type	Perm	NA			NA	Perm			Prot	Prot
Protected Phases		2			2				4	4
Permitted Phases	2					2				
Detector Phase	2	2			2	2			4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0			5.0	5.0			9.0	9.0
Minimum Split (s)	24.0	24.0			24.0	24.0			24.0	24.0
Total Split (s)	56.0	56.0			56.0	56.0			34.0	34.0
Total Split (%)	62.2%	62.2%			62.2%	62.2%			37.8%	37.8%
Maximum Green (s)	50.0	50.0			50.0	50.0			28.0	28.0
Yellow Time (s)	4.0	4.0			4.0	4.0			4.0	4.0
All-Red Time (s)	2.0	2.0			2.0	2.0			2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0	0.0			0.0	0.0
Total Lost Time (s)	6.0	6.0			6.0	6.0			6.0	6.0
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0			3.0	3.0			3.0	3.0
Recall Mode	C-Max	C-Max			C-Max	C-Max			Min	Min
Act Effct Green (s)		50.0			50.0	50.0			28.0	28.0
Actuated g/C Ratio		0.56			0.56	0.56			0.31	0.31
v/c Ratio		0.96			0.61	0.82			0.93	0.99
Control Delay		24.0			15.2	21.4			59.2	71.0
Queue Delay		45.2			4.2	0.0			0.0	0.0
Total Delay		69.2			19.4	21.4			59.2	71.0
LOS		E			B	C			E	E
Approach Delay		69.2			20.4				65.1	
Approach LOS		E			C				E	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Queue Length 50th (ft)		619			227	308			252	271
Queue Length 95th (ft)		m590			291	418			#441	#478
Internal Link Dist (ft)		292			314		518		439	
Turn Bay Length (ft)						200				
Base Capacity (vph)		1966			1966	1564			492	467
Starvation Cap Reductn		929			0	0			0	0
Spillback Cap Reductn		0			664	0			0	0
Storage Cap Reductn		0			0	0			0	0
Reduced v/c Ratio		1.82			0.93	0.82			0.93	0.99

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 45.5	Intersection LOS: D
Intersection Capacity Utilization 129.2%	ICU Level of Service H
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 21: Exit 4A NB Off & Connector Road & Exit 4A NB On



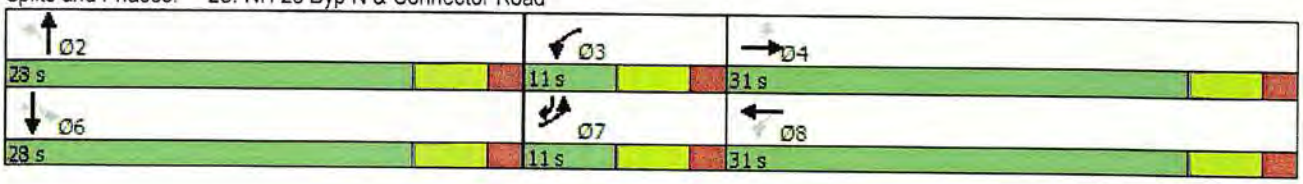
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	380	10	10	390	10	20	50	10	10	60	100
Future Volume (vph)	100	380	10	10	390	10	20	50	10	10	60	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275		0	75		100	75		0	210		210
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.996			0.975				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1855	0	1770	1855	0	1770	1816	0	1770	1863	1583
Flt Permitted	0.290			0.424			0.715			0.715		
Satd. Flow (perm)	540	1855	0	790	1855	0	1332	1816	0	1332	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			2			11				109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		314			303			290			341	
Travel Time (s)		7.1			6.9			6.6			7.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	413	11	11	424	11	22	54	11	11	65	109
Shared Lane Traffic (%)												
Lane Group Flow (vph)	109	424	0	11	435	0	22	65	0	11	65	109
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		3	8		2	2		6	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	28.0		11.0	28.0		28.0	28.0		28.0	28.0	11.0
Total Split (s)	11.0	31.0		11.0	31.0		28.0	28.0		28.0	28.0	11.0
Total Split (%)	15.7%	44.3%		15.7%	44.3%		40.0%	40.0%		40.0%	40.0%	15.7%
Maximum Green (s)	5.0	25.0		5.0	25.0		22.0	22.0		22.0	22.0	5.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		Max	Max		Max	Max	None
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		15.0			15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	26.2	25.3		22.8	19.0		22.6	22.6		22.6	22.6	33.9
Actuated g/C Ratio	0.42	0.41		0.37	0.31		0.36	0.36		0.36	0.36	0.55
v/c Ratio	0.33	0.56		0.03	0.76		0.05	0.10		0.02	0.10	0.12
Control Delay	12.2	17.6		8.9	29.5		16.7	14.7		16.5	16.8	2.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	12.2	17.6		8.9	29.5		16.7	14.7		16.5	16.8	2.9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	B		A	C		B	B		B	B	A
Approach Delay		16.5			29.0			15.2			8.6	
Approach LOS		B			C			B			A	
Queue Length 50th (ft)	23	107		2	153		6	14		3	17	0
Queue Length 95th (ft)	46	239		9	247		21	42		14	46	23
Internal Link Dist (ft)		234			223			210			261	
Turn Bay Length (ft)	275			75			75			210		210
Base Capacity (vph)	329	872		370	766		483	666		483	676	911
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.33	0.49		0.03	0.57		0.05	0.10		0.02	0.10	0.12

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 62.2
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 19.7 — Intersection LOS: B
Intersection Capacity Utilization 49.4% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 23: NH 28 Byp N & Connector Road



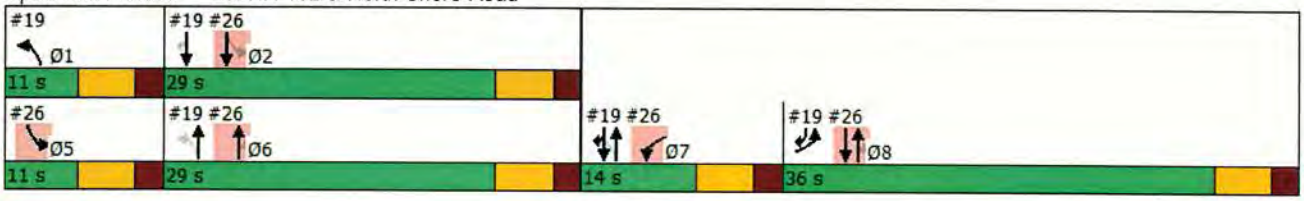
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø1	Ø2	Ø6	Ø8
Lane Configurations										
Traffic Volume (vph)	90	10	540	40	10	650				
Future Volume (vph)	90	10	540	40	10	650				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	0	0		90	100					
Storage Lanes	1	0		1	1					
Taper Length (ft)	25				25					
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Frt	0.983			0.850						
Flt Protected	0.958				0.950					
Satd. Flow (prot)	1774	0	1900	1615	1805	1900				
Flt Permitted	0.958				0.256					
Satd. Flow (perm)	1774	0	1900	1615	486	1900				
Right Turn on Red		Yes		Yes						
Satd. Flow (RTOR)	6			38						
Link Speed (mph)	30		30			30				
Link Distance (ft)	524		258			288				
Travel Time (s)	11.9		5.9			6.5				
Peak Hour Factor	0.87	0.67	0.95	0.84	0.73	0.96				
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%				
Adj. Flow (vph)	103	15	568	48	14	677				
Shared Lane Traffic (%)										
Lane Group Flow (vph)	118	0	568	48	14	677				
Turn Type	Prot		NA	Perm	custom	NA				
Protected Phases	7		6 8		5	2 8	1	2	6	8
Permitted Phases				6 8	2					
Detector Phase	7		6 8	6 8	5	2 8				
Switch Phase										
Minimum Initial (s)	5.0				5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	11.0				11.0		11.0	28.0	28.0	26.5
Total Split (s)	14.0				11.0		11.0	29.0	29.0	36.0
Total Split (%)	15.6%				12.2%		12%	32%	32%	40%
Maximum Green (s)	8.0				5.0		5.0	23.0	23.0	30.0
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0				0.0					
Total Lost Time (s)	6.0				6.0					
Lead/Lag	Lead				Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes				Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0				3.0		3.0	3.0	3.0	3.0
Recall Mode	None				None		None	Min	Min	None
Walk Time (s)								7.0	7.0	
Flash Dont Walk (s)								15.0	15.0	
Pedestrian Calls (#/hr)								0	0	
Act Effct Green (s)	8.1		52.3	52.3	16.3	49.3				
Actuated g/C Ratio	0.11		0.69	0.69	0.22	0.65				
v/c Ratio	0.60		0.43	0.04	0.07	0.55				
Control Delay	48.5		2.2	0.8	19.7	7.3				
Queue Delay	0.0		0.2	0.0	0.0	0.0				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø1	Ø2	Ø6	Ø8
Total Delay	48.5		2.5	0.8	19.7	7.3				
LOS	D		A	A	B	A				
Approach Delay	48.5		2.3			7.6				
Approach LOS	D		A			A				
Queue Length 50th (ft)	45		7	0	5	103				
Queue Length 95th (ft)	#140		m78	m0	14	151				
Internal Link Dist (ft)	444		178			208				
Turn Bay Length (ft)				90	100					
Base Capacity (vph)	197		1529	1308	194	1465				
Starvation Cap Reductn	0		360	0	0	0				
Spillback Cap Reductn	0		0	0	0	0				
Storage Cap Reductn	0		0	0	0	0				
Reduced v/c Ratio	0.60		0.49	0.04	0.07	0.46				

Intersection Summary

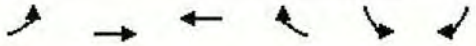
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 75.5
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 8.7 Intersection LOS: A
Intersection Capacity Utilization 49.8% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 26: NH 102 & North Shore Road



APPENDIX P-4: 2040 ALTERNATIVE B INTERSECTION CAPACITY ANALYSES – SYNCHRO PRINOUTS – PM PEAK HOUR

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1180	1385	0	390	1300
Future Volume (vph)	0	1180	1385	0	390	1300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.88
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3471	3406	0	1930	2682
Flt Permitted					0.950	
Satd. Flow (perm)	0	3471	3406	0	1930	2682
Right Turn on Red				Yes		No
Satd. Flow (RTOR)						
Link Speed (mph)		30	30		25	
Link Distance (ft)		712	388		212	
Travel Time (s)		16.2	8.8		5.8	
Peak Hour Factor	0.93	0.93	0.88	0.88	0.89	0.89
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Adj. Flow (vph)	0	1269	1574	0	438	1461
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1269	1574	0	438	1461
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		24	24		16	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	0.85	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors		3	3		3	3
Detector Template		Thru	Thru		Left	
Leading Detector (ft)		256	256		256	256
Trailing Detector (ft)		-5	-5		-5	-5
Detector 1 Position(ft)		-5	-5		-5	-5
Detector 1 Size(ft)		50	50		50	50
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		125	125		125	125
Detector 2 Size(ft)		6	6		6	6
Detector 2 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0		0.0	0.0
Detector 3 Position(ft)		250	250		250	250
Detector 3 Size(ft)		6	6		6	6
Detector 3 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 3 Channel						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 3 Extend (s)		0.0	0.0		0.0	0.0
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0		5.0	5.0
Minimum Split (s)		14.0	21.0		27.0	27.0
Total Split (s)		70.0	70.0		80.0	80.0
Total Split (%)		46.7%	46.7%		53.3%	53.3%
Maximum Green (s)		64.0	64.0		74.0	74.0
Yellow Time (s)		2.0	2.0		2.0	2.0
All-Red Time (s)		4.0	4.0		4.0	4.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		14.0	14.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		64.0	64.0		74.0	74.0
Actuated g/C Ratio		0.43	0.43		0.49	0.49
v/c Ratio		0.86	1.08		0.46	1.10
Control Delay		31.3	46.1		26.9	94.6
Queue Delay		0.0	1.2		0.0	0.0
Total Delay		31.3	47.4		26.9	94.6
LOS		C	D		C	F
Approach Delay		31.3	47.4		79.0	
Approach LOS		C	D		E	
Queue Length 50th (ft)		373	~913		276	~921
Queue Length 95th (ft)		443	m34		365	#1051
Internal Link Dist (ft)		632	308		132	
Turn Bay Length (ft)						
Base Capacity (vph)		1480	1453		952	1323
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	4		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.86	1.09		0.46	1.10

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.10

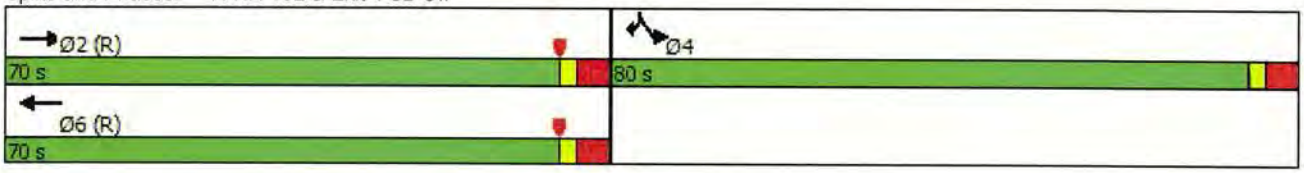
Intersection Signal Delay: 55.7 Intersection LOS: E
Intersection Capacity Utilization 95.8% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: NH 102 & Exit 4 SB Off



Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	1345	0	750	0	0	1140	430	0	0	310	330
Future Volume (vph)	1345	0	750	0	0	1140	430	0	0	310	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0	0	0	550		0	0		0
Storage Lanes		2	2	0	0	2		0	0		1
Taper Length (ft)		25		25		25			25		
Lane Util. Factor	0.97	1.00	0.88	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt			0.850								0.850
Flt Protected	0.950					0.950					
Satd. Flow (prot)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Flt Permitted	0.950					0.950					
Satd. Flow (perm)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Right Turn on Red			No					Yes			Yes
Satd. Flow (RTOR)											359
Link Speed (mph)		25		30			30			30	
Link Distance (ft)		856		390			760			857	
Travel Time (s)		23.3		8.9			17.3			19.5	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Adj. Flow (vph)	1528	0	852	0	0	1213	457	0	0	337	359
Shared Lane Traffic (%)											
Lane Group Flow (vph)	1528	0	852	0	0	1213	457	0	0	337	359
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		24		0			24			24	
Link Offset(ft)		12		0			0			0	
Crosswalk Width(ft)		16		16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	25	15	9	15		9	15		25
Number of Detectors	3		3			3	3			3	0
Detector Template											
Leading Detector (ft)	256		256			256	256			256	0
Trailing Detector (ft)	-5		-5			-5	-5			-5	0
Detector 1 Position(ft)	-5		-5			-5	-5			-5	-5
Detector 1 Size(ft)	55		55			55	55			55	50
Detector 1 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Queue (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Delay (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 2 Position(ft)	125		125			125	125			125	
Detector 2 Size(ft)	6		6			6	6			6	
Detector 2 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	
Detector 2 Channel											
Detector 2 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Detector 3 Position(ft)	250		250			250	250			250	
Detector 3 Size(ft)	6		6			6	6			6	

Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	
Detector 3 Channel											
Detector 3 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Detector Phase	8		2			5	2			6	
Switch Phase											
Minimum Initial (s)	10.0		10.0			5.0	8.0			8.0	
Minimum Split (s)	16.0		16.0			11.0	42.0			31.0	
Total Split (s)	66.0		66.0			52.0	84.0			32.0	
Total Split (%)	44.0%		44.0%			34.7%	56.0%			21.3%	
Maximum Green (s)	60.0		60.0			46.0	78.0			26.0	
Yellow Time (s)	2.0		2.0			2.0	2.0			2.0	
All-Red Time (s)	4.0		4.0			4.0	4.0			4.0	
Lost Time Adjust (s)	0.0		0.0			0.0	0.0			0.0	
Total Lost Time (s)	6.0		6.0			6.0	6.0			6.0	
Lead/Lag						Lead				Lag	
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Recall Mode	None		None			None	C-Min			C-Min	
Walk Time (s)							7.0			7.0	
Flash Dont Walk (s)							29.0			17.0	
Pedestrian Calls (#/hr)							0			0	
Act Effct Green (s)	60.0		60.0			46.0	78.0			26.0	150.0
Actuated g/C Ratio	0.40		0.40			0.31	0.52			0.17	1.00
v/c Ratio	1.18		0.81			1.19	0.26			0.56	0.23
Control Delay	128.9		47.3			122.6	8.2			60.7	0.3
Queue Delay	0.0		0.0			0.0	0.0			0.0	0.0
Total Delay	128.9		47.3			122.6	8.2			60.7	0.3
LOS	F		D			F	A			E	A
Approach Delay		99.7					91.3			29.6	
Approach LOS		F					F			C	
Queue Length 50th (ft)	~919		417			~734	80			161	0
Queue Length 95th (ft)	#1018		498			#863	m97			215	0
Internal Link Dist (ft)		776		310			680			777	
Turn Bay Length (ft)						550					
Base Capacity (vph)	1296		1052			1022	1787			607	1568
Starvation Cap Reductn	0		0			0	0			0	0
Spillback Cap Reductn	0		0			0	0			0	0
Storage Cap Reductn	0		0			0	0			0	0
Reduced v/c Ratio	1.18		0.81			1.19	0.26			0.56	0.23

Intersection Summary	
Area Type:	Other
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 57 (38%), Referenced to phase 2:NET and 6:SWT, Start of Yellow	
Natural Cycle: 150	

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.19
Intersection Signal Delay: 86.4 Intersection LOS: F
Intersection Capacity Utilization 95.5% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: NH 102 & Exit 4 NB Off

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	790	420	150	610	0	0	0	0	175	0	425
Future Volume (vph)	0	790	420	150	610	0	0	0	0	175	0	425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		350	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3471	1553	1719	3438	0	0	0	0	3367	0	1553
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	3471	1553	1719	3438	0	0	0	0	3367	0	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			483									213
Link Speed (mph)		30			30			30			35	
Link Distance (ft)		851			693			486			581	
Travel Time (s)		19.3			15.8			11.0			11.3	
Peak Hour Factor	0.87	0.87	0.87	0.86	0.86	0.86	0.92	0.92	0.92	0.91	0.91	0.91
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	0	908	483	174	709	0	0	0	0	192	0	467
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	908	483	174	709	0	0	0	0	192	0	467
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Right	Left	Right
Median Width(ft)		36			36			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		25	15		9	15		9	15		25
Number of Detectors		3	3	3	3					3		3
Detector Template		Thru	Right	Left	Thru					Left		Right
Leading Detector (ft)		256	256	256	256					256		256
Trailing Detector (ft)		-5	-5	-5	-5					-5		-5
Detector 1 Position(ft)		-5	-5	-5	-5					-5		-5
Detector 1 Size(ft)		50	50	50	50					50		50
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 2 Position(ft)		125	125	125	125					125		125
Detector 2 Size(ft)		6	6	6	6					6		6
Detector 2 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 3 Position(ft)		250	250	250	250					250		250
Detector 3 Size(ft)		6	6	6	6					6		6

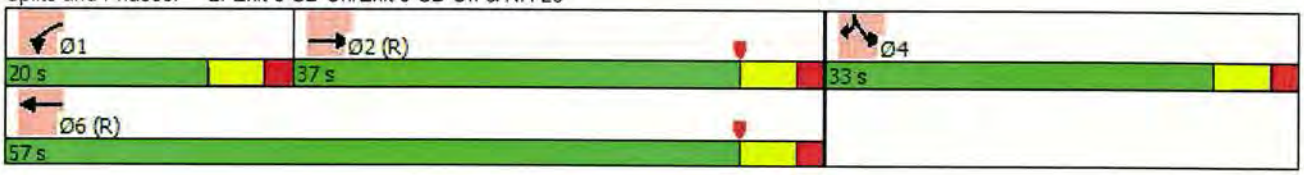
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 3 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 3 Channel												
Detector 3 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Detector Phase		2		1	6					4		4
Switch Phase												
Minimum Initial (s)		9.0		4.0	9.0					4.0		4.0
Minimum Split (s)		21.0		10.0	21.0					10.0		10.0
Total Split (s)		37.0		20.0	57.0					33.0		33.0
Total Split (%)		41.1%		22.2%	63.3%					36.7%		36.7%
Maximum Green (s)		31.0		14.0	51.0					27.0		27.0
Yellow Time (s)		4.0		4.0	4.0					4.0		4.0
All-Red Time (s)		2.0		2.0	2.0					2.0		2.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0					6.0		6.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Recall Mode		C-Min		None	C-Min					None		None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		8.0			8.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)		36.6	90.0	12.8	55.3					22.7		22.7
Actuated g/C Ratio		0.41	1.00	0.14	0.61					0.25		0.25
v/c Ratio		0.64	0.31	0.72	0.34					0.23		0.85
Control Delay		25.8	0.5	23.2	0.3					26.0		31.8
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		25.8	0.5	23.2	0.3					26.0		31.8
LOS		C	A	C	A					C		C
Approach Delay		17.0			4.8						30.1	
Approach LOS		B			A						C	
Queue Length 50th (ft)		238	0	2	0					41		132
Queue Length 95th (ft)		296	0	3	m0					67		#265
Internal Link Dist (ft)		771			613			406			501	
Turn Bay Length (ft)			350									
Base Capacity (vph)		1410	1553	269	2114					1010		615
Starvation Cap Reductn		0	0	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.64	0.31	0.65	0.34					0.19		0.76

Intersection Summary

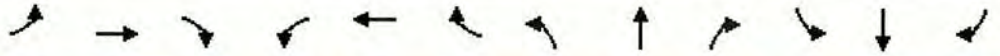
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 51 (57%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 60

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 16.3 Intersection LOS: B
Intersection Capacity Utilization 75.1% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Exit 5 SB On/Exit 5 SB Off & NH 28



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	495	470	0	0	410	400	350	0	385	0	0	0
Future Volume (vph)	495	470	0	0	410	400	350	0	385	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1752	3505	0	0	3505	1568	1703	0	1524	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1752	3505	0	0	3505	1568	1703	0	1524	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						440			339			
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		693			542			867			392	
Travel Time (s)		15.8			12.3			16.9			8.9	
Peak Hour Factor	0.92	0.92	0.92	0.91	0.91	0.91	0.67	0.67	0.67	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	6%	6%	6%	2%	2%	2%
Adj. Flow (vph)	538	511	0	0	451	440	522	0	575	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	538	511	0	0	451	440	522	0	575	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Right	Left	Right	Left	Left	Right
Median Width(ft)		36			42			12			12	
Link Offset(ft)		0			0			0			36	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		25	15		25	15		9
Number of Detectors	3	3			3	3	3		0			
Detector Template	Left					Right	Left					
Leading Detector (ft)	256	256			256	256	256		0			
Trailing Detector (ft)	-5	-5			-5	-5	-5		0			
Detector 1 Position(ft)	-5	-5			-5	-5	-5		-5			
Detector 1 Size(ft)	50	50			50	50	50		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 2 Position(ft)	125	125			125	125	125					
Detector 2 Size(ft)	6	6			6	6	6					
Detector 2 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex					
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0			0.0	0.0	0.0					
Detector 3 Position(ft)	250	250			250	250	250					
Detector 3 Size(ft)	6	6			6	6	6					
Detector 3 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex					
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0			0.0	0.0	0.0					

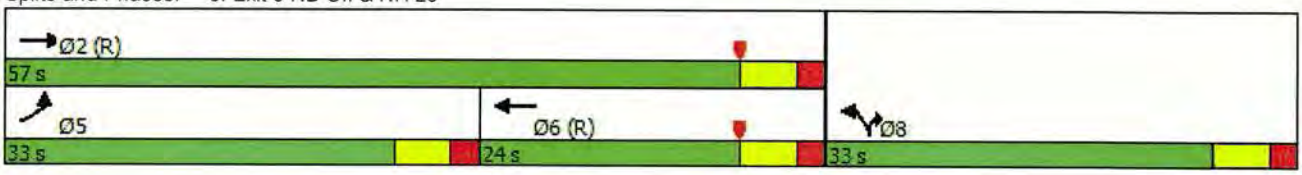


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Detector Phase	5	2			6		8		8			
Switch Phase												
Minimum Initial (s)	4.0	16.0			16.0		4.0		4.0			
Minimum Split (s)	10.0	23.0			23.0		11.0		11.0			
Total Split (s)	33.0	57.0			24.0		33.0		33.0			
Total Split (%)	36.7%	63.3%			26.7%		36.7%		36.7%			
Maximum Green (s)	27.0	51.0			18.0		27.0		27.0			
Yellow Time (s)	4.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	2.0	2.0			2.0		2.0		2.0			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.0		6.0		6.0			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		10.0			10.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	27.0	50.6			17.6	90.0	27.4		27.4			
Actuated g/C Ratio	0.30	0.56			0.20	1.00	0.30		0.30			
v/c Ratio	1.02	0.26			0.66	0.28	1.01		0.82			
Control Delay	53.9	3.3			38.5	0.4	75.1		23.2			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	53.9	3.3			38.5	0.4	75.1		23.2			
LOS	D	A			D	A	E		C			
Approach Delay		29.3			19.7			47.9				
Approach LOS		C			B			D				
Queue Length 50th (ft)	~316	6			124	0	~307		127			
Queue Length 95th (ft)	#493	8			176	0	287		110			
Internal Link Dist (ft)		613			462			787			312	
Turn Bay Length (ft)												
Base Capacity (vph)	525	1986			701	1568	518		699			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.02	0.26			0.64	0.28	1.01		0.82			

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 33.2		Intersection LOS: C	

Intersection Capacity Utilization 75.1% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Exit 5 NB Off & NH 28



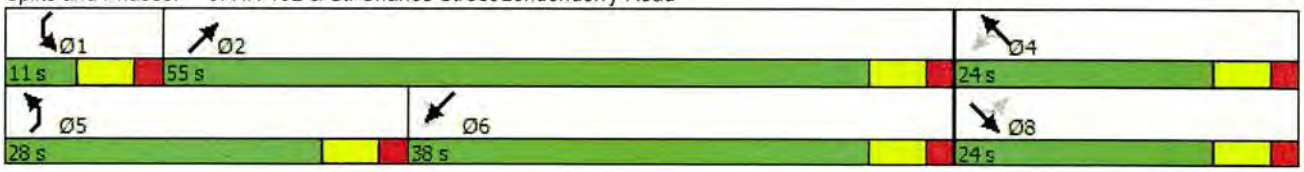
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	80	5	120	10	0	10	210	830	120	5	610	100
Future Volume (vph)	80	5	120	10	0	10	210	830	120	5	610	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		225	0		0	350		0	100		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.932			0.981			0.979	
Flt Protected		0.955			0.976		0.950			0.950		
Satd. Flow (prot)	0	1779	1583	0	1728	0	1770	3472	0	1770	3465	0
Flt Permitted		0.808			0.795		0.950			0.950		
Satd. Flow (perm)	0	1505	1583	0	1408	0	1770	3472	0	1770	3465	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182		182			28			23	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		593			447			750			330	
Travel Time (s)		13.5			10.2			17.0			7.5	
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	87	5	130	40	0	40	228	902	130	5	663	109
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	92	130	0	80	0	228	1032	0	5	772	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	3	1	3	1		3	3		3	3	
Detector Template	Left	Thru	Right	Left			Left	Thru		Left	Thru	
Leading Detector (ft)	256	256	45	256	45		256	256		256	256	
Trailing Detector (ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Position(ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	125	125		125			125	125		125	125	
Detector 2 Size(ft)	6	6		6			6	6		6	6	
Detector 2 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Detector 3 Position(ft)	250	250		250			250	250		250	250	
Detector 3 Size(ft)	6	6		6			6	6		6	6	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	custom	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Detector Phase	8	8	6	4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	8.0	5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		24.0	24.0		11.0	24.0	
Total Split (s)	24.0	24.0	38.0	24.0	24.0		28.0	55.0		11.0	38.0	
Total Split (%)	26.7%	26.7%	42.2%	26.7%	26.7%		31.1%	61.1%		12.2%	42.2%	
Maximum Green (s)	18.0	18.0	32.0	18.0	18.0		22.0	49.0		5.0	32.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lead/Lag			Lag				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	Min	None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0			0	
Act Effct Green (s)		10.7	27.3		10.5		14.8	49.5		5.6	27.3	
Actuated g/C Ratio		0.16	0.40		0.15		0.22	0.73		0.08	0.40	
v/c Ratio		0.39	0.17		0.22		0.59	0.41		0.03	0.55	
Control Delay		35.6	1.8		1.4		34.2	6.9		38.0	18.8	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		35.6	1.8		1.4		34.2	6.9		38.0	18.8	
LOS		D	A		A		C	A		D	B	
Approach Delay		15.8			1.4			11.8			18.9	
Approach LOS		B			A			B			B	
Queue Length 50th (ft)		40	0		0		99	85		2	131	
Queue Length 95th (ft)		90	15		0		181	224		14	235	
Internal Link Dist (ft)		513			367			670			250	
Turn Bay Length (ft)			225				350			100		
Base Capacity (vph)		443	915		542		637	2595		144	1824	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.21	0.14		0.15		0.36	0.40		0.03	0.42	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 68.2	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	

Maximum v/c Ratio: 0.59
Intersection Signal Delay: 14.2 Intersection LOS: B
Intersection Capacity Utilization 58.4% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 9: NH 102 & St. Charles Street/Londonderry Road



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	80	5	250	0	60	0	680	130	15	345	0
Future Volume (vph)	20	80	5	250	0	60	0	680	130	15	345	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994			0.974			0.978				
Flt Protected		0.991			0.961						0.998	
Satd. Flow (prot)	0	1835	0	0	1727	0	0	1721	0	0	1806	0
Flt Permitted		0.906			0.644						0.819	
Satd. Flow (perm)	0	1678	0	0	1157	0	0	1721	0	0	1482	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			36			18				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		356			493			1124			603	
Travel Time (s)		8.1			11.2			25.5			13.7	
Peak Hour Factor	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Adj. Flow (vph)	33	133	8	260	0	63	0	764	146	17	401	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	174	0	0	323	0	0	910	0	0	418	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		-22			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	1		3	2			2		3	2	
Detector Template	Left			Left						Left		
Leading Detector (ft)	256	45		256	131			131		256	131	
Trailing Detector (ft)	-5	-5		-5	-5			-5		-5	-5	
Detector 1 Position(ft)	-5	-5		-5	-5			-5		-5	-5	
Detector 1 Size(ft)	50	50		50	50			50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 2 Position(ft)	125			125	125			125		125	125	
Detector 2 Size(ft)	6			6	6			6		6	6	
Detector 2 Type	Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0	0.0			0.0		0.0	0.0	
Detector 3 Position(ft)	250			250						250		
Detector 3 Size(ft)	6			6						6		
Detector 3 Type	Cl+Ex			Cl+Ex						Cl+Ex		
Detector 3 Channel												
Detector 3 Extend (s)	0.0			0.0						0.0		

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Detector Phase	4	4		4	4			2		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0			24.0		24.0	24.0	
Total Split (s)	32.0	32.0		32.0	32.0			58.0		58.0	58.0	
Total Split (%)	35.6%	35.6%		35.6%	35.6%			64.4%		64.4%	64.4%	
Maximum Green (s)	26.0	26.0		26.0	26.0			52.0		52.0	52.0	
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Recall Mode	None	None		None	None			Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		24.5			24.5			48.8			48.8	
Actuated g/C Ratio		0.29			0.29			0.57			0.57	
v/c Ratio		0.36			0.91			0.92			0.49	
Control Delay		27.3			58.1			32.6			13.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		27.3			58.1			32.6			13.5	
LOS		C			E			C			B	
Approach Delay		27.3			58.1			32.6			13.5	
Approach LOS		C			E			C			B	
Queue Length 50th (ft)		77			158			420			130	
Queue Length 95th (ft)		83			#320			#700			191	
Internal Link Dist (ft)		276			413			1044			523	
Turn Bay Length (ft)												
Base Capacity (vph)		519			381			1069			915	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.34			0.85			0.85			0.46	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 85.4			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 32.2		Intersection LOS: C	
Intersection Capacity Utilization 81.2%		ICU Level of Service D	

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: NH 102 & Fordway/Madden Hill Road

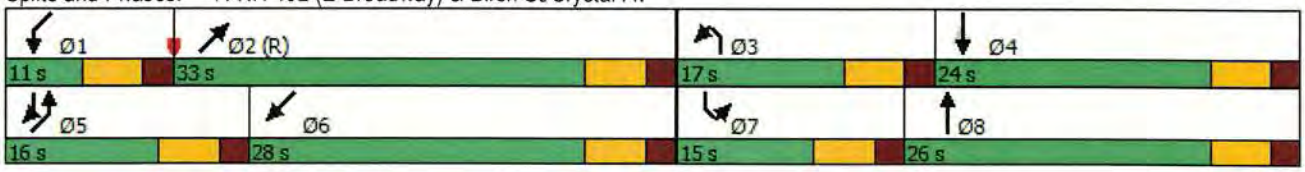
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	150	200	20	70	240	10	90	420	40	60	280	210
Future Volume (vph)	150	200	20	70	240	10	90	420	40	60	280	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	70		0	245		245	390		0	110		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986				0.850		0.987			0.936	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1819	0	1752	1845	1568	1787	1857	0	1787	1761	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1819	0	1752	1845	1568	1787	1857	0	1787	1761	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				116		6			43	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		361			411			477			530	
Travel Time (s)		8.2			9.3			10.8			12.0	
Peak Hour Factor	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95	0.94	0.94	0.94
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	165	220	22	75	258	11	95	442	42	64	298	223
Shared Lane Traffic (%)												
Lane Group Flow (vph)	165	242	0	75	258	11	95	484	0	64	521	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4	5	5	2		1	6	
Permitted Phases						4						
Detector Phase	3	8		7	4	5	5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	10.0	4.0	4.0	10.0		4.0	9.0	
Minimum Split (s)	17.0	24.0		11.0	24.0	16.0	16.0	24.0		11.0	24.0	
Total Split (s)	17.0	26.0		15.0	24.0	16.0	16.0	33.0		11.0	28.0	
Total Split (%)	20.0%	30.6%		17.6%	28.2%	18.8%	18.8%	38.8%		12.9%	32.9%	
Maximum Green (s)	11.0	20.0		9.0	18.0	10.0	10.0	27.0		5.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max		None	None	
Act Effct Green (s)	10.5	20.5		8.0	15.7	30.6	8.8	31.2		5.9	28.3	
Actuated g/C Ratio	0.12	0.24		0.09	0.18	0.36	0.10	0.37		0.07	0.33	
v/c Ratio	0.76	0.55		0.45	0.76	0.02	0.51	0.71		0.52	0.85	
Control Delay	59.4	33.3		45.1	47.3	0.0	45.7	31.9		55.6	42.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	59.4	33.3		45.1	47.3	0.0	45.7	31.9		55.6	42.9	
LOS	E	C		D	D	A	D	C		E	D	
Approach Delay		43.9			45.3			34.2			44.3	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		D			D			C			D	
Queue Length 50th (ft)	86	113		38	129	0	48	233		34	~268	
Queue Length 95th (ft)	#180	186		80	207	0	95	#394		#93	#488	
Internal Link Dist (ft)		281			331			397			450	
Turn Bay Length (ft)	70			245		245	390			110		
Base Capacity (vph)	226	456		185	390	657	210	686		123	615	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.73	0.53		0.41	0.66	0.02	0.45	0.71		0.52	0.85	

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 0 (0%), Referenced to phase 2:NET, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 41.3 Intersection LOS: D
Intersection Capacity Utilization 87.9% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: NH 102 (E Broadway) & Birch St/Crystal Av



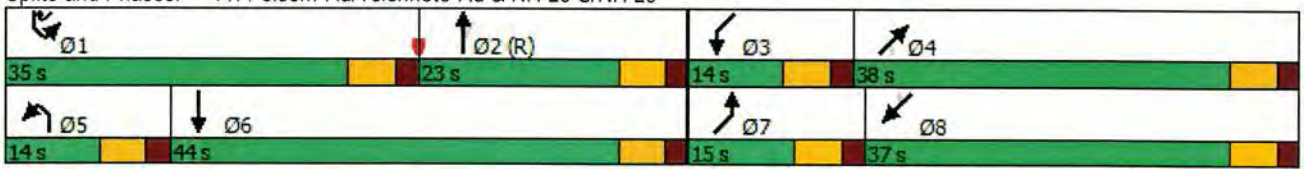
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	60	320	110	550	390	0	60	360	50	45	180	625
Future Volume (vph)	60	320	110	550	390	0	60	360	50	45	180	625
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		90	360		0	190		180	0		210
Storage Lanes	1		1	2		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	3433	3539	0	1770	1863	1583	1787	1881	1599
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	3433	3539	0	1770	1863	1583	1787	1881	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			208						208			165
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		639			503			532			387	
Travel Time (s)		14.5			11.4			12.1			8.8	
Peak Hour Factor	0.92	0.92	0.92	0.94	0.94	0.94	0.96	0.96	0.96	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	65	348	120	585	415	0	63	375	52	47	189	658
Shared Lane Traffic (%)												
Lane Group Flow (vph)	65	348	120	585	415	0	63	375	52	47	189	658
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6		7	4		3	8	1
Permitted Phases			2						4			8
Detector Phase	5	2	2	1	6		7	4	4	3	8	1
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		7.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	14.0	22.0	22.0	14.0	22.0		13.0	22.0	22.0	14.0	22.0	14.0
Total Split (s)	14.0	23.0	23.0	35.0	44.0		15.0	38.0	38.0	14.0	37.0	35.0
Total Split (%)	12.7%	20.9%	20.9%	31.8%	40.0%		13.6%	34.5%	34.5%	12.7%	33.6%	31.8%
Maximum Green (s)	8.0	17.0	17.0	29.0	38.0		9.0	32.0	32.0	8.0	31.0	29.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	None		None	None	None	None	None	None
Walk Time (s)		5.0	5.0		5.0			5.0	5.0		5.0	
Flash Dont Walk (s)		11.0	11.0		11.0			11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0			0	0		0	
Act Effct Green (s)	8.4	28.9	28.9	25.2	48.4		8.4	26.7	26.7	8.0	26.2	57.4
Actuated g/C Ratio	0.08	0.26	0.26	0.23	0.44		0.08	0.24	0.24	0.07	0.24	0.52
v/c Ratio	0.48	0.38	0.21	0.74	0.27		0.47	0.83	0.10	0.36	0.42	0.72
Control Delay	61.1	38.3	0.8	55.3	26.8		60.4	55.0	0.4	57.0	37.7	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	61.1	38.3	0.8	55.3	26.8		60.4	55.0	0.4	57.0	37.7	18.7
LOS	E	D	A	E	C		E	E	A	E	D	B
Approach Delay		32.6			43.5			49.9			24.7	
Approach LOS		C			D			D			C	
Queue Length 50th (ft)	44	112	0	226	102		43	250	0	32	113	253
Queue Length 95th (ft)	91	173	0	288	155		88	343	0	71	171	330
Internal Link Dist (ft)		559			423			452			307	
Turn Bay Length (ft)	110		90	360			190		180			210
Base Capacity (vph)	135	928	568	905	1558		144	541	608	129	530	962
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.38	0.21	0.65	0.27		0.44	0.69	0.09	0.36	0.36	0.68

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 36.8 Intersection LOS: D
Intersection Capacity Utilization 70.2% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 11: Folsom Rd/Tsienneto Rd & NH 28 S/NH 28



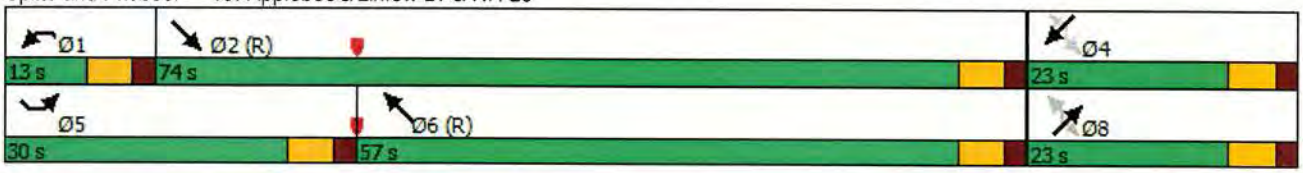
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	160	1185	5	20	890	80	15	10	15	10	10	60
Future Volume (vph)	160	1185	5	20	890	80	15	10	15	10	10	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	115		0	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.988				0.850			0.850
Flt Protected	0.950			0.950				0.971			0.976	
Satd. Flow (prot)	1787	3571	0	1787	3531	0	0	1845	1615	0	1836	1599
Flt Permitted	0.950			0.950				0.799			0.827	
Satd. Flow (perm)	1787	3571	0	1787	3531	0	0	1518	1615	0	1556	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			11				149			149
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		277			644			230			387	
Travel Time (s)		6.3			14.6			5.2			8.8	
Peak Hour Factor	0.97	0.97	0.97	0.95	0.95	0.95	0.90	0.90	0.90	0.80	0.80	0.80
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	165	1222	5	21	937	84	17	11	17	13	13	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	165	1227	0	21	1021	0	0	28	17	0	26	75
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4	4	4
Detector Phase	5	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	26.0	63.0		11.0	48.0		21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	30.0	74.0		13.0	57.0		23.0	23.0	23.0	23.0	23.0	23.0
Total Split (%)	27.3%	67.3%		11.8%	51.8%		20.9%	20.9%	20.9%	20.9%	20.9%	20.9%
Maximum Green (s)	24.0	68.0		7.0	51.0		17.0	17.0	17.0	17.0	17.0	17.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0			11.0		8.0	8.0	8.0	8.0	8.0	8.0
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	0
Act Effct Green (s)	15.4	88.4		6.9	71.4			7.5	7.5		7.5	7.5
Actuated g/C Ratio	0.14	0.80		0.06	0.65			0.07	0.07		0.07	0.07
v/c Ratio	0.66	0.43		0.19	0.44			0.27	0.07		0.25	0.30
Control Delay	54.6	6.4		52.7	11.3			54.7	0.5		53.5	3.1
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	54.6	6.4		52.7	11.3			54.7	0.5		53.5	3.1
LOS	D	A		D	B			D	A		D	A
Approach Delay		12.1			12.1			34.2			16.1	
Approach LOS		B			B			C			B	
Queue Length 50th (ft)	115	82		13	190			19	0		18	0
Queue Length 95th (ft)	m177	284		m27	253			48	0		40	0
Internal Link Dist (ft)		197			564			150			307	
Turn Bay Length (ft)	100			115								
Base Capacity (vph)	389	2869		120	2296			234	375		240	373
Starvation Cap Reductn	0	0		0	0			0	0		0	0
Spillback Cap Reductn	0	0		0	0			0	0		0	0
Storage Cap Reductn	0	0		0	0			0	0		0	0
Reduced v/c Ratio	0.42	0.43		0.17	0.44			0.12	0.05		0.11	0.20

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 12.7 Intersection LOS: B
Intersection Capacity Utilization 60.1% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Applebee's/Linlew Dr & NH 28



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	180	140	820	300	20	130	640	940	30	530	180
Future Volume (vph)	50	180	140	820	300	20	130	640	940	30	530	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	220		0	100		265	200		0
Storage Lanes	1		1	2		0	1		2	1		1
Taper Length (ft)	150			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	0.95	0.95	1.00	0.95	0.88	1.00	0.95	1.00
Frt			0.850		0.991				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1881	1599	3433	3507	0	1805	3610	2842	1805	3610	1615
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1787	1881	1599	3433	3507	0	1805	3610	2842	1805	3610	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			149		6				806			209
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		877			438			391			343	
Travel Time (s)		19.9			10.0			8.9			7.8	
Peak Hour Factor	0.84	0.84	0.84	0.90	0.90	0.90	0.78	0.78	0.78	0.86	0.86	0.86
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	60	214	167	911	333	22	167	821	1205	35	616	209
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	214	167	911	355	0	167	821	1205	35	616	209
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6		3	8	1	7	4	5
Permitted Phases			2						8		4	4
Detector Phase	5	2	3	1	6		3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	8.0	8.0	5.0	8.0	8.0		5.0	5.0	8.0	5.0	8.0	8.0
Minimum Split (s)	22.0	22.0	9.5	22.0	22.0		9.5	22.0	22.0	9.5	22.0	22.0
Total Split (s)	22.0	25.0	20.0	38.0	41.0		20.0	28.0	38.0	19.0	27.0	22.0
Total Split (%)	20.0%	22.7%	18.2%	34.5%	37.3%		18.2%	25.5%	34.5%	17.3%	24.5%	20.0%
Maximum Green (s)	16.0	19.0	15.5	32.0	35.0		15.5	22.0	32.0	14.5	21.0	16.0
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0		3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.5	6.0	6.0		4.5	6.0	6.0	4.5	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	C-Max	None	None	None		None	None	None	None	None	Max
Walk Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effct Green (s)	16.0	19.0	38.9	32.0	35.0		13.9	33.1	71.1	7.6	22.6	44.6
Actuated g/C Ratio	0.15	0.17	0.35	0.29	0.32		0.13	0.30	0.65	0.07	0.21	0.41
v/c Ratio	0.23	0.66	0.25	0.91	0.32		0.73	0.76	0.57	0.28	0.83	0.27
Control Delay	44.2	53.3	6.2	50.5	40.1		65.0	41.7	4.7	53.5	53.4	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	44.2	53.3	6.2	50.5	40.1		65.0	41.7	4.7	53.5	53.4	4.0
LOS	D	D	A	D	D		E	D	A	D	D	A
Approach Delay		34.2			47.5			23.1			41.4	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	38	142	8	344	128		113	291	68	24	225	0
Queue Length 95th (ft)	73	207	44	#445	176		158	315	72	53	#299	39
Internal Link Dist (ft)		797			358			311			263	
Turn Bay Length (ft)	100			220			100		265	200		
Base Capacity (vph)	259	324	682	998	1119		254	1084	2121	237	741	778
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.66	0.24	0.91	0.32		0.66	0.76	0.57	0.15	0.83	0.27

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 33.9 Intersection LOS: C
Intersection Capacity Utilization 73.5% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 22: Connector Road & NH 28

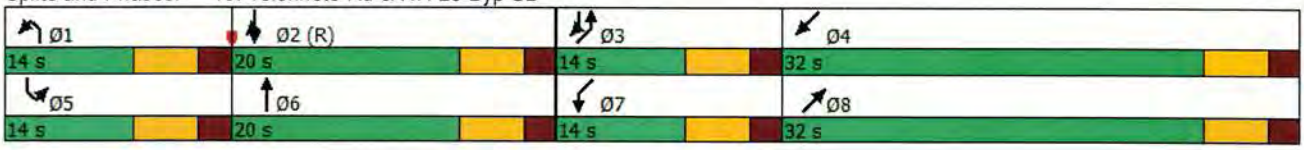
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	70	20	80	60	20	30	430	70	20	210	50
Future Volume (vph)	30	70	20	80	60	20	30	430	70	20	210	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		150	190		190	135		150	120		150
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967				0.850		0.979			0.971	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1801	0	1787	1881	1599	1805	1860	0	1805	1845	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1801	0	1787	1881	1599	1805	1860	0	1805	1845	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15				123		11			16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		481			347			479			371	
Travel Time (s)		10.9			7.9			10.9			8.4	
Peak Hour Factor	0.99	0.99	0.99	0.95	0.95	0.95	0.89	0.89	0.89	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	30	71	20	84	63	21	34	483	79	22	226	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	91	0	84	63	21	34	562	0	22	280	0
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases		6			2							
Detector Phase	1	6		5	2	2 3	3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	20.0		14.0	20.0		14.0	28.0		14.0	14.0	
Total Split (s)	14.0	20.0		14.0	20.0		14.0	32.0		14.0	32.0	
Total Split (%)	17.5%	25.0%		17.5%	25.0%		17.5%	40.0%		17.5%	40.0%	
Maximum Green (s)	8.0	14.0		8.0	14.0		8.0	26.0		8.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	C-Max		None	None		None	None	
Walk Time (s)								7.0				
Flash Dont Walk (s)								15.0				
Pedestrian Calls (#/hr)								0				
Act Effct Green (s)	8.0	24.1		8.2	29.9	43.9	8.0	26.9		8.0	24.1	
Actuated g/C Ratio	0.10	0.30		0.10	0.37	0.55	0.10	0.34		0.10	0.30	
v/c Ratio	0.17	0.16		0.46	0.09	0.02	0.19	0.89		0.12	0.49	
Control Delay	35.5	23.4		42.6	23.8	0.1	35.8	43.8		34.6	25.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	35.5	23.4		42.6	23.8	0.1	35.8	43.8		34.6	25.1	
LOS	D	C		D	C	A	D	D		C	C	
Approach Delay		26.4			30.2			43.3			25.8	
Approach LOS		C			C			D			C	
Queue Length 50th (ft)	14	29		40	17	0	16	236		10	123	
Queue Length 95th (ft)	39	74		85	61	0	42	#450		32	173	
Internal Link Dist (ft)		401			267			399			291	
Turn Bay Length (ft)	200			190		190	135			120		
Base Capacity (vph)	177	553		183	704	933	180	644		180	621	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.17	0.16		0.46	0.09	0.02	0.19	0.87		0.12	0.45	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 35.3 Intersection LOS: D
Intersection Capacity Utilization 48.0% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: Tsienneto Rd & NH 28 Byp SB



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø2	Ø5	Ø6	Ø7
Lane Configurations										
Traffic Volume (vph)	660	10	40	140	100	720				
Future Volume (vph)	660	10	40	140	100	720				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	0	0	120			90				
Storage Lanes	1	0	1			1				
Taper Length (ft)	25		25							
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Frt	0.998					0.850				
Flt Protected	0.953		0.950							
Satd. Flow (prot)	1789	0	1770	1863	1845	1568				
Flt Permitted	0.953		0.653							
Satd. Flow (perm)	1789	0	1216	1863	1845	1568				
Right Turn on Red		Yes				Yes				
Satd. Flow (RTOR)	1					809				
Link Speed (mph)	30			30	30					
Link Distance (ft)	475			709	258					
Travel Time (s)	10.8			16.1	5.9					
Peak Hour Factor	0.90	0.90	0.87	0.87	0.89	0.89				
Heavy Vehicles (%)	1%	1%	2%	2%	3%	3%				
Adj. Flow (vph)	733	11	46	161	112	809				
Shared Lane Traffic (%)										
Lane Group Flow (vph)	744	0	46	161	112	809				
Turn Type	Prot		pm+pt	NA	NA	custom				
Protected Phases	8		1	6 7	2 7	7 8	2	5	6	7
Permitted Phases			6 7			2				
Detector Phase	8		1	6 7	2 7	7 8				
Switch Phase										
Minimum Initial (s)	5.0		5.0				5.0	5.0	5.0	5.0
Minimum Split (s)	26.5		11.0				28.0	11.0	28.0	11.0
Total Split (s)	46.0		11.0				29.0	11.0	29.0	14.0
Total Split (%)	46.0%		11.0%				29%	11%	29%	14%
Maximum Green (s)	40.0		5.0				23.0	5.0	23.0	8.0
Yellow Time (s)	4.0		4.0				4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0				2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0							
Total Lost Time (s)	6.0		6.0							
Lead/Lag	Lag		Lead				Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes		Yes				Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0		3.0				3.0	3.0	3.0	3.0
Recall Mode	None		None				Max	None	Max	None
Walk Time (s)							7.0		7.0	
Flash Dont Walk (s)							15.0		15.0	
Pedestrian Calls (#/hr)							0		0	
Act Effct Green (s)	40.1		42.3	41.3	37.1	85.8				
Actuated g/C Ratio	0.42		0.44	0.43	0.39	0.90				
v/c Ratio	0.99		0.08	0.20	0.16	0.54				
Control Delay	60.5		14.6	18.4	23.6	1.6				
Queue Delay	0.0		0.0	0.0	0.0	0.5				

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø2	Ø5	Ø6	Ø7
Total Delay	60.5		14.6	18.4	23.6	2.1				
LOS	E		B	B	C	A				
Approach Delay	60.5			17.5	4.7					
Approach LOS	E			B	A					
Queue Length 50th (ft)	~515		15	56	47	9				
Queue Length 95th (ft)	#744		33	114	m80	7				
Internal Link Dist (ft)	395			629	178					
Turn Bay Length (ft)			120			90				
Base Capacity (vph)	751		566	805	716	1490				
Starvation Cap Reductn	0		0	0	0	287				
Spillback Cap Reductn	0		0	0	0	0				
Storage Cap Reductn	0		0	0	0	0				
Reduced v/c Ratio	0.99		0.08	0.20	0.16	0.67				

Intersection Summary

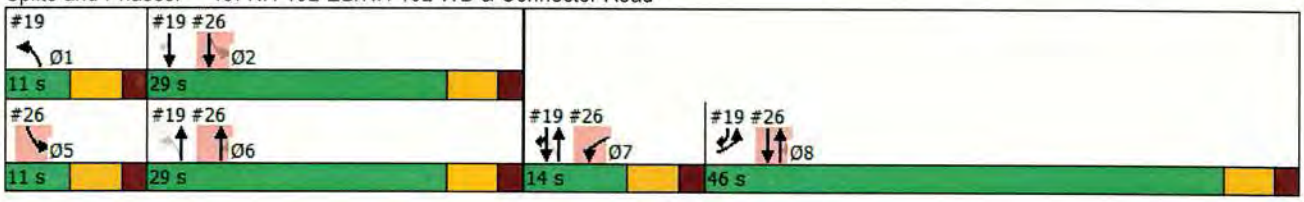
Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 95.6
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 28.3 Intersection LOS: C
Intersection Capacity Utilization 58.7% ICU Level of Service B
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: NH 102 EB/NH 102 WB & Connector Road

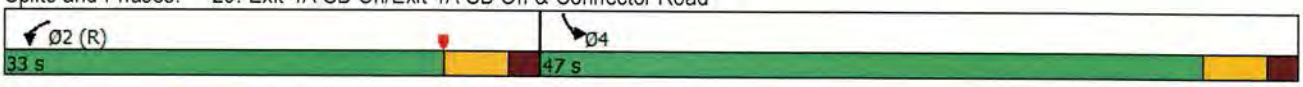


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰↰				↰↰	
Traffic Volume (vph)	1010	0	0	0	1575	0
Future Volume (vph)	1010	0	0	0	1575	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	1.00	0.97	1.00
Frt						
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3433	0	0	0	3433	0
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3433	0	0	0	3433	0
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (mph)	30		30			30
Link Distance (ft)	372		529			557
Travel Time (s)	8.5		12.0			12.7
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1074	0	0	0	1676	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1074	0	0	0	1676	0
Turn Type	Prot				Prot	
Protected Phases	2				4	
Permitted Phases						
Detector Phase	2				4	
Switch Phase						
Minimum Initial (s)	5.0				9.0	
Minimum Split (s)	24.0				24.0	
Total Split (s)	33.0				47.0	
Total Split (%)	41.3%				58.8%	
Maximum Green (s)	27.0				41.0	
Yellow Time (s)	4.0				4.0	
All-Red Time (s)	2.0				2.0	
Lost Time Adjust (s)	0.0				0.0	
Total Lost Time (s)	6.0				6.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0				3.0	
Recall Mode	C-Max				Min	
Act Effct Green (s)	27.0				41.0	
Actuated g/C Ratio	0.34				0.51	
v/c Ratio	0.93				0.95	
Control Delay	41.8				32.7	
Queue Delay	38.6				0.0	
Total Delay	80.4				32.7	
LOS	F				C	
Approach Delay	80.4					32.7
Approach LOS	F					C
Queue Length 50th (ft)	307				387	
Queue Length 95th (ft)	#408				#563	
Internal Link Dist (ft)	292		449			477

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Bay Length (ft)						
Base Capacity (vph)	1158				1759	
Starvation Cap Reductn	167				0	
Spillback Cap Reductn	0				0	
Storage Cap Reductn	0				0	
Reduced v/c Ratio	1.08				0.95	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 25 (31%), Referenced to phase 2:WBL, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 51.3		Intersection LOS: D	
Intersection Capacity Utilization 129.3%		ICU Level of Service H	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 20: Exit 4A SB On/Exit 4A SB Off & Connector Road

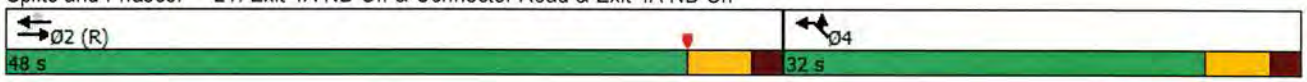


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations										
Traffic Volume (vph)	0	1575	0	0	1010	1075	0	0	0	770
Future Volume (vph)	0	1575	0	0	1010	1075	0	0	0	770
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	0		200	0	0	0	0
Storage Lanes	1		0	0		2	0	0	1	1
Taper Length (ft)	75			25			25		25	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.88	1.00	1.00	1.00	0.95
Frt						0.850			0.850	0.850
Flt Protected										
Satd. Flow (prot)	1863	3539	0	0	3539	2787	0	0	1583	1504
Flt Permitted										
Satd. Flow (perm)	1863	3539	0	0	3539	2787	0	0	1583	1504
Right Turn on Red			Yes			Yes		Yes		
Satd. Flow (RTOR)						64				
Link Speed (mph)		30			30		30		30	
Link Distance (ft)		372			394		598		519	
Travel Time (s)		8.5			9.0		13.6		11.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1676	0	0	1074	1144	0	0	0	819
Shared Lane Traffic (%)										50%
Lane Group Flow (vph)	0	1676	0	0	1074	1144	0	0	410	409
Turn Type	Perm	NA			NA	Perm			Prot	Prot
Protected Phases		2			2				4	4
Permitted Phases	2					2				
Detector Phase	2	2			2	2			4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0			5.0	5.0			9.0	9.0
Minimum Split (s)	24.0	24.0			24.0	24.0			24.0	24.0
Total Split (s)	48.0	48.0			48.0	48.0			32.0	32.0
Total Split (%)	60.0%	60.0%			60.0%	60.0%			40.0%	40.0%
Maximum Green (s)	42.0	42.0			42.0	42.0			26.0	26.0
Yellow Time (s)	4.0	4.0			4.0	4.0			4.0	4.0
All-Red Time (s)	2.0	2.0			2.0	2.0			2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0	0.0			0.0	0.0
Total Lost Time (s)	6.0	6.0			6.0	6.0			6.0	6.0
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0			3.0	3.0			3.0	3.0
Recall Mode	C-Max	C-Max			C-Max	C-Max			Max	Max
Act Effct Green (s)		42.0			42.0	42.0			26.0	26.0
Actuated g/C Ratio		0.52			0.52	0.52			0.32	0.32
v/c Ratio		0.90			0.58	0.77			0.80	0.84
Control Delay		4.6			14.5	18.5			38.3	42.6
Queue Delay		0.4			0.9	0.0			0.0	0.0
Total Delay		5.0			15.5	18.5			38.3	42.6
LOS		A			B	B			D	D
Approach Delay		5.0			17.0				40.5	
Approach LOS		A			B				D	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Queue Length 50th (ft)		3			180	228			184	196
Queue Length 95th (ft)		m5			238	319			#330	#361
Internal Link Dist (ft)		292			314		518		439	
Turn Bay Length (ft)						200				
Base Capacity (vph)		1857			1857	1493			514	488
Starvation Cap Reductn		26			0	0			0	0
Spillback Cap Reductn		0			474	0			0	0
Storage Cap Reductn		0			0	0			0	0
Reduced v/c Ratio		0.92			0.78	0.77			0.80	0.84

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Yellow			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 16.8		Intersection LOS: B	
Intersection Capacity Utilization 115.2%		ICU Level of Service H	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 21: Exit 4A NB Off & Connector Road & Exit 4A NB On



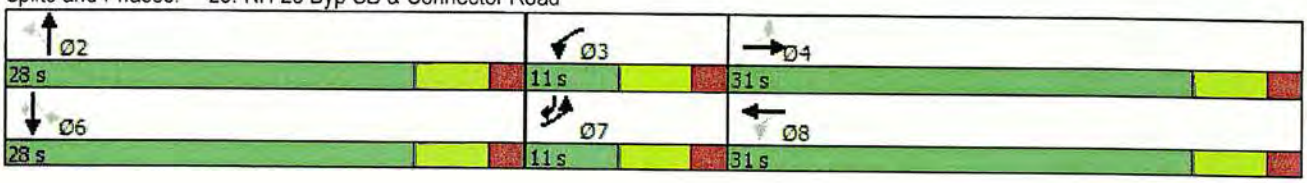
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	490	10	10	500	10	20	70	10	10	70	130
Future Volume (vph)	130	490	10	10	500	10	20	70	10	10	70	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275		0	75		100	75		0	210		210
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.997			0.981				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1857	0	1770	1857	0	1770	1827	0	1770	1863	1583
Flt Permitted	0.198			0.332			0.708			0.701		
Satd. Flow (perm)	369	1857	0	618	1857	0	1319	1827	0	1306	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			2			11				141
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		310			410			481			432	
Travel Time (s)		7.0			9.3			10.9			9.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	141	533	11	11	543	11	22	76	11	11	76	141
Shared Lane Traffic (%)												
Lane Group Flow (vph)	141	544	0	11	554	0	22	87	0	11	76	141
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		3	8		2	2		6	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	28.0		11.0	28.0		28.0	28.0		28.0	28.0	11.0
Total Split (s)	11.0	31.0		11.0	31.0		28.0	28.0		28.0	28.0	11.0
Total Split (%)	15.7%	44.3%		15.7%	44.3%		40.0%	40.0%		40.0%	40.0%	15.7%
Maximum Green (s)	5.0	25.0		5.0	25.0		22.0	22.0		22.0	22.0	5.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Max		None	None		Max	Max		None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		15.0			15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	32.8	31.8		27.9	22.9		22.0	22.0		22.0	22.0	33.1
Actuated g/C Ratio	0.48	0.47		0.41	0.34		0.32	0.32		0.32	0.32	0.49
v/c Ratio	0.50	0.63		0.03	0.88		0.05	0.15		0.03	0.13	0.17
Control Delay	16.3	19.4		8.8	39.3		17.2	16.2		17.0	17.8	2.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	16.3	19.4		8.8	39.3		17.2	16.2		17.0	17.8	2.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	B		A	D		B	B		B	B	A
Approach Delay		18.8			38.7			16.4			8.5	
Approach LOS		B			D			B			A	
Queue Length 50th (ft)	30	149		2	213		7	23		3	23	0
Queue Length 95th (ft)	58	#373		9	#384		21	53		14	51	26
Internal Link Dist (ft)		230			330			401			352	
Turn Bay Length (ft)	275			75			75			210		210
Base Capacity (vph)	281	869		338	685		427	599		423	603	841
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.50	0.63		0.03	0.81		0.05	0.15		0.03	0.13	0.17

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 68
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 24.2 Intersection LOS: C
Intersection Capacity Utilization 56.9% ICU Level of Service B
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 23: NH 28 Byp SB & Connector Road



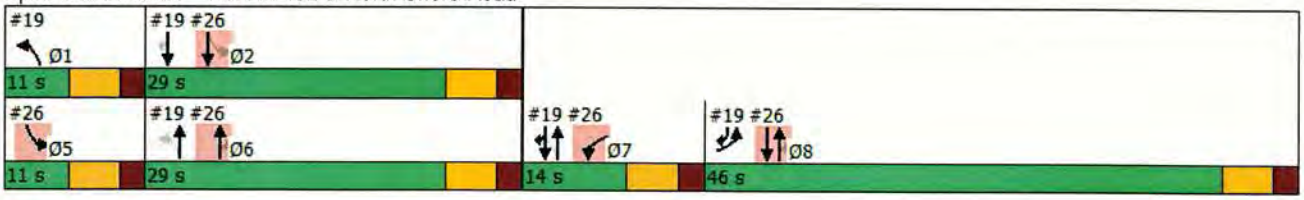
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø1	Ø2	Ø6	Ø8
Lane Configurations										
Traffic Volume (vph)	80	10	640	160	10	740				
Future Volume (vph)	80	10	640	160	10	740				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	0	0		90	100					
Storage Lanes	1	0		1	1					
Taper Length (ft)	25				25					
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Frt	0.981			0.850						
Flt Protected	0.959				0.950					
Satd. Flow (prot)	1772	0	1900	1615	1805	1900				
Flt Permitted	0.959				0.218					
Satd. Flow (perm)	1772	0	1900	1615	414	1900				
Right Turn on Red		Yes		Yes						
Satd. Flow (RTOR)	6			126						
Link Speed (mph)	30		30			30				
Link Distance (ft)	524		258			288				
Travel Time (s)	11.9		5.9			6.5				
Peak Hour Factor	0.87	0.67	0.95	0.84	0.73	0.96				
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%				
Adj. Flow (vph)	92	15	674	190	14	771				
Shared Lane Traffic (%)										
Lane Group Flow (vph)	107	0	674	190	14	771				
Turn Type	Prot		NA	Perm	custom	NA				
Protected Phases	7		6 8		5	2 8	1	2	6	8
Permitted Phases				6 8	2					
Detector Phase	7		6 8	6 8	5	2 8				
Switch Phase										
Minimum Initial (s)	5.0				5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	11.0				11.0		11.0	28.0	28.0	26.5
Total Split (s)	14.0				11.0		11.0	29.0	29.0	46.0
Total Split (%)	14.0%				11.0%		11%	29%	29%	46%
Maximum Green (s)	8.0				5.0		5.0	23.0	23.0	40.0
Yellow Time (s)	4.0				4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	2.0				2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0				0.0					
Total Lost Time (s)	6.0				6.0					
Lead/Lag	Lead				Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes				Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0				3.0		3.0	3.0	3.0	3.0
Recall Mode	None				None		None	Max	Max	None
Walk Time (s)								7.0	7.0	
Flash Dont Walk (s)								15.0	15.0	
Pedestrian Calls (#/hr)								0	0	
Act Effct Green (s)	8.0		72.3	72.3	25.9	65.8				
Actuated g/C Ratio	0.08		0.76	0.76	0.27	0.69				
v/c Ratio	0.69		0.47	0.15	0.08	0.59				
Control Delay	65.8		1.5	0.5	23.2	7.4				
Queue Delay	0.0		1.6	0.5	0.0	0.0				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø1	Ø2	Ø6	Ø8
Total Delay	65.8		3.1	1.0	23.2	7.4				
LOS	E		A	A	C	A				
Approach Delay	65.8		2.6			7.7				
Approach LOS	E		A			A				
Queue Length 50th (ft)	64		13	0	6	127				
Queue Length 95th (ft)	#142		m59	m0	16	182				
Internal Link Dist (ft)	444		178			208				
Turn Bay Length (ft)				90	100					
Base Capacity (vph)	154		1437	1252	185	1307				
Starvation Cap Reductn	0		555	726	0	0				
Spillback Cap Reductn	0		0	0	0	0				
Storage Cap Reductn	0		0	0	0	0				
Reduced v/c Ratio	0.69		0.76	0.36	0.08	0.59				

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 95.6
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 8.8 Intersection LOS: A
Intersection Capacity Utilization 54.0% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 26: NH 102 & North Shore Road



APPENDIX Q-1: ALTERNATIVE C INTERSECTION CAPACITY ANALYSES – HCS PRINTSOUTS – AM PEAK HOUR

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1255	1330	0	125	1325
Future Volume (vph)	0	1255	1330	0	125	1325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		0.95	0.95		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3406		1930	2682
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3406		1930	2682
Peak-hour factor, PHF	0.93	0.93	0.88	0.88	0.89	0.89
Adj. Flow (vph)	0	1349	1511	0	140	1489
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1349	1511	0	140	1489
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		57.0	57.0		71.0	71.0
Effective Green, g (s)		57.0	57.0		71.0	71.0
Actuated g/C Ratio		0.41	0.41		0.51	0.51
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1413	1386		978	1360
v/s Ratio Prot		0.39	c0.44		0.07	c0.56
v/s Ratio Perm						
v/c Ratio		0.95	1.09		0.14	1.09
Uniform Delay, d1		40.2	41.5		18.3	34.5
Progression Factor		0.71	0.07		1.00	1.00
Incremental Delay, d2		11.0	42.0		0.1	54.6
Delay (s)		39.6	45.0		18.4	89.1
Level of Service		D	D		B	F
Approach Delay (s)		39.6	45.0		83.0	
Approach LOS		D	D		F	

Intersection Summary			
HCM 2000 Control Delay	57.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	1250	0	910	0	0	1085	295	0	0	420	240
Future Volume (vph)	1250	0	910	0	0	1085	295	0	0	420	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0	6.0			6.0	4.0
Lane Util. Factor	0.97		0.88			0.97	0.95			0.95	1.00
Frt	1.00		0.85			1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)	3242		2632			3335	3438			3505	1568
Flt Permitted	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (perm)	3242		2632			3335	3438			3505	1568
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	1420	0	1034	0	0	1154	314	0	0	457	261
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1420	0	1034	0	0	1154	314	0	0	457	261
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Actuated Green, G (s)	54.0		54.0			42.0	74.0			26.0	140.0
Effective Green, g (s)	54.0		54.0			42.0	74.0			26.0	140.0
Actuated g/C Ratio	0.39		0.39			0.30	0.53			0.19	1.00
Clearance Time (s)	6.0		6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	1250		1015			1000	1817			650	1568
v/s Ratio Prot	c0.44		0.39			c0.35	0.09			c0.13	
v/s Ratio Perm											0.17
v/c Ratio	1.14		1.02			1.15	0.17			0.70	0.17
Uniform Delay, d1	43.0		43.0			49.0	17.1			53.4	0.0
Progression Factor	1.00		1.00			0.44	0.15			1.00	1.00
Incremental Delay, d2	71.5		33.0			75.1	0.1			6.3	0.2
Delay (s)	114.5		76.0			96.4	2.7			59.6	0.2
Level of Service	F		E			F	A			E	A
Approach Delay (s)		98.3		0.0			76.4			38.0	
Approach LOS		F		A			E			D	

Intersection Summary			
HCM 2000 Control Delay	82.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	640	470	160	615	0	0	0	0	180	0	390
Future Volume (vph)	0	640	470	160	615	0	0	0	0	180	0	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3471	1553	1719	3438					3367		1553
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3471	1553	1719	3438					3367		1553
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	0	736	540	186	715	0	0	0	0	198	0	429
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	154
Lane Group Flow (vph)	0	736	540	186	715	0	0	0	0	198	0	275
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Actuated Green, G (s)		36.1	90.0	14.2	56.3					21.7		21.7
Effective Green, g (s)		36.1	90.0	14.2	56.3					21.7		21.7
Actuated g/C Ratio		0.40	1.00	0.16	0.63					0.24		0.24
Clearance Time (s)		6.0		6.0	6.0					6.0		6.0
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Lane Grp Cap (vph)		1392	1553	271	2150					811		374
v/s Ratio Prot		c0.21		c0.11	0.21					0.06		c0.18
v/s Ratio Perm			0.35									
v/c Ratio		0.53	0.35	0.69	0.33					0.24		0.74
Uniform Delay, d1		20.5	0.0	35.8	8.0					27.5		31.5
Progression Factor		1.00	1.00	0.35	0.02					1.00		1.00
Incremental Delay, d2		1.4	0.6	4.6	0.2					0.2		7.3
Delay (s)		21.9	0.6	17.3	0.4					27.7		38.8
Level of Service		C	A	B	A					C		D
Approach Delay (s)		12.9			3.9			0.0			35.3	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	440	380	0	0	455	230	320	0	370	0	0	0
Future Volume (vph)	440	380	0	0	455	230	320	0	370	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1752	3505			3505	1568	1703		1524			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1752	3505			3505	1568	1703		1524			
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.67	0.67	0.67	0.92	0.92	0.92
Adj. Flow (vph)	478	413	0	0	500	253	478	0	552	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	288	0	0	0
Lane Group Flow (vph)	478	413	0	0	500	253	478	0	264	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	6%	6%	6%	2%	2%	2%
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Actuated Green, G (s)	26.9	50.1			17.2	90.0	27.9		27.9			
Effective Green, g (s)	26.9	50.1			17.2	90.0	27.9		27.9			
Actuated g/C Ratio	0.30	0.56			0.19	1.00	0.31		0.31			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Lane Grp Cap (vph)	523	1951			669	1568	527		472			
v/s Ratio Prot	c0.27	0.12			c0.14		c0.28		0.17			
v/s Ratio Perm						0.16						
v/c Ratio	0.91	0.21			0.75	0.16	0.91		0.56			
Uniform Delay, d1	30.4	10.0			34.3	0.0	29.8		25.9			
Progression Factor	0.27	0.33			1.00	1.00	1.00		1.00			
Incremental Delay, d2	19.1	0.2			7.5	0.2	19.2		1.4			
Delay (s)	27.2	3.6			41.8	0.2	49.0		27.3			
Level of Service	C	A			D	A	D		C			
Approach Delay (s)		16.3			27.8			37.4			0.0	
Approach LOS		B			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	5	210	10	0	10	270	820	120	5	590	130
Future Volume (vph)	10	5	210	10	0	10	270	820	120	5	590	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.93		1.00	0.98		1.00	0.97	
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1801	1583		1729		1770	3472		1770	3443	
Flt Permitted		0.87	1.00		0.83		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1622	1583		1477		1770	3472		1770	3443	
Peak-hour factor, PHF	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	5	228	40	0	40	293	891	130	5	641	141
RTOR Reduction (vph)	0	0	125	0	75	0	0	9	0	0	17	0
Lane Group Flow (vph)	0	16	103	0	5	0	293	1012	0	5	765	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	custom	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Actuated Green, G (s)		4.8	32.6		4.8		16.9	48.7		0.8	32.6	
Effective Green, g (s)		4.8	32.6		4.8		16.9	48.7		0.8	32.6	
Actuated g/C Ratio		0.07	0.45		0.07		0.23	0.67		0.01	0.45	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		107	713		98		413	2338		19	1552	
v/s Ratio Prot							c0.17	0.29		0.00	c0.22	
v/s Ratio Perm		c0.01	0.06		0.00							
v/c Ratio		0.15	0.14		0.05		0.71	0.43		0.26	0.49	
Uniform Delay, d1		31.8	11.7		31.6		25.4	5.4		35.5	14.0	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6	0.1		0.2		5.5	0.1		7.3	0.2	
Delay (s)		32.5	11.8		31.9		31.0	5.6		42.7	14.3	
Level of Service		C	B		C		C	A		D	B	
Approach Delay (s)		13.1			31.9			11.2			14.4	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	20	5	270	0	50	0	730	130	10	380	0
Future Volume (vph)	20	20	5	270	0	50	0	730	130	10	380	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.98			0.98			1.00	
Flt Protected		0.98			0.96			1.00			1.00	
Satd. Flow (prot)		1796			1733			1723			1807	
Flt Permitted		0.83			0.71			1.00			0.89	
Satd. Flow (perm)		1530			1279			1723			1610	
Peak-hour factor, PHF	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	33	33	8	281	0	52	0	820	146	12	442	0
RTOR Reduction (vph)	0	5	0	0	27	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	69	0	0	306	0	0	959	0	0	454	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Actuated Green, G (s)		22.3			22.3			52.1			52.1	
Effective Green, g (s)		22.3			22.3			52.1			52.1	
Actuated g/C Ratio		0.26			0.26			0.60			0.60	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		394			330			1038			970	
v/s Ratio Prot								c0.56				
v/s Ratio Perm		0.04			c0.24						0.28	
v/c Ratio		0.17			0.93			0.92			0.47	
Uniform Delay, d1		24.9			31.3			15.4			9.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			31.2			13.2			0.4	
Delay (s)		25.1			62.5			28.6			9.8	
Level of Service		C			E			C			A	
Approach Delay (s)		25.1			62.5			28.6			9.8	
Approach LOS		C			E			C			A	

Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	86.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	70	310	20	130	400	60	80	390	30	50	270	60
Future Volume (vph)	70	310	20	130	400	60	80	390	30	50	270	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1828		1752	1845	1568	1787	1861		1787	1830	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1828		1752	1845	1568	1787	1861		1787	1830	
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95	0.94	0.94	0.94
Adj. Flow (vph)	77	341	22	140	430	65	84	411	32	53	287	64
RTOR Reduction (vph)	0	3	0	0	0	42	0	3	0	0	9	0
Lane Group Flow (vph)	77	360	0	140	430	23	84	440	0	53	342	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4	5	5	2		1	6	
Permitted Phases						4						
Actuated Green, G (s)	5.8	18.7		8.4	21.3	28.1	6.8	26.7		2.7	22.6	
Effective Green, g (s)	5.8	18.7		8.4	21.3	28.1	6.8	26.7		2.7	22.6	
Actuated g/C Ratio	0.07	0.23		0.10	0.26	0.35	0.08	0.33		0.03	0.28	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	126	424		182	488	664	150	617		59	513	
v/s Ratio Prot	0.04	0.20		c0.08	c0.23	0.00	c0.05	c0.24		0.03	0.19	
v/s Ratio Perm						0.01						
v/c Ratio	0.61	0.85		0.77	0.88	0.03	0.56	0.71		0.90	0.67	
Uniform Delay, d1	36.3	29.5		35.1	28.4	17.3	35.4	23.5		38.8	25.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.5	14.6		17.6	16.8	0.0	4.7	6.9		80.5	3.3	
Delay (s)	44.7	44.2		52.7	45.2	17.3	40.1	30.4		119.3	28.9	
Level of Service	D	D		D	D	B	D	C		F	C	
Approach Delay (s)		44.3			44.0			32.0			40.8	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	40.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	80.5	Sum of lost time (s)	24.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	465	10	10	160	100	535
Future Volume (vph)	465	10	10	160	100	535
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	120	0			220
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.997		
Satd. Flow (prot)	1787	1599	0	1857	1881	1599
Flt Permitted	0.950			0.997		
Satd. Flow (perm)	1787	1599	0	1857	1881	1599
Link Speed (mph)	30			30	30	
Link Distance (ft)	322			309	354	
Travel Time (s)	7.3			7.0	8.0	
Peak Hour Factor	0.90	0.90	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	1%	2%	2%	1%	1%
Adj. Flow (vph)	517	11	11	184	115	615
Shared Lane Traffic (%)						
Lane Group Flow (vph)	517	11	0	195	115	615
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	68.8
Intersection LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	465	10	10	160	100	535
Future Vol, veh/h	465	10	10	160	100	535
Peak Hour Factor	0.90	0.90	0.87	0.87	0.87	0.87
Heavy Vehicles, %	1	1	2	2	1	1
Mvmt Flow	517	11	11	184	115	615
Number of Lanes	1	1	0	1	1	1

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	2
HCM Control Delay	88.9	16.1	68.3
HCM LOS	F	C	F

Lane	NBLn1	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	6%	100%	0%	0%	0%
Vol Thru, %	94%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	170	465	10	100	535
LT Vol	10	465	0	0	0
Through Vol	160	0	0	100	0
RT Vol	0	0	10	0	535
Lane Flow Rate	195	517	11	115	615
Geometry Grp	4	7	7	7	7
Degree of Util (X)	0.404	1.075	0.019	0.22	1.057
Departure Headway (Hd)	7.845	7.695	6.471	7.175	6.458
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	461	475	556	503	566
Service Time	5.845	5.395	4.171	4.875	4.158
HCM Lane V/C Ratio	0.423	1.088	0.02	0.229	1.087
HCM Control Delay	16.1	90.6	9.3	11.9	78.9
HCM Lane LOS	C	F	A	B	F
HCM 95th-tile Q	1.9	16.1	0.1	0.8	17

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	0	0	625	635	10
Future Volume (vph)	10	0	0	625	635	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.998	
Flt Protected	0.950					
Satd. Flow (prot)	1703	0	0	1881	1877	0
Flt Permitted	0.950					
Satd. Flow (perm)	1703	0	0	1881	1877	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	160			224	319	
Travel Time (s)	3.6			5.1	7.3	
Peak Hour Factor	0.50	0.50	0.93	0.93	0.86	0.86
Heavy Vehicles (%)	6%	6%	1%	1%	1%	1%
Adj. Flow (vph)	20	0	0	672	738	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	0	0	672	750	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 50.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	0	0	625	635	10
Future Vol, veh/h	10	0	0	625	635	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	93	93	86	86
Heavy Vehicles, %	6	6	1	1	1	1
Mvmt Flow	20	0	0	672	738	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1416	744	750	0	-	0
Stage 1	744	-	-	-	-	-
Stage 2	672	-	-	-	-	-
Critical Hdwy	6.46	6.26	4.11	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.354	2.209	-	-	-
Pot Cap-1 Maneuver	148	408	864	-	-	-
Stage 1	463	-	-	-	-	-
Stage 2	500	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	148	408	864	-	-	-
Mov Cap-2 Maneuver	148	-	-	-	-	-
Stage 1	463	-	-	-	-	-
Stage 2	500	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	33.1	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	864	-	148	-	-
HCM Lane V/C Ratio	-	-	0.135	-	-
HCM Control Delay (s)	0	-	33.1	-	-
HCM Lane LOS	A	-	D	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	40	590	5	30	410	20	100	40	230	5	20	150
Future Volume (vph)	40	590	5	30	410	20	100	40	230	5	20	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	0		0	150		150
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.994			0.916			0.884	
Flt Protected		0.997			0.997			0.987			0.999	
Satd. Flow (prot)	0	1874	0	0	1846	0	0	1718	0	0	1678	0
Flt Permitted		0.997			0.997			0.987			0.999	
Satd. Flow (perm)	0	1874	0	0	1846	0	0	1718	0	0	1678	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		327			240			246			251	
Travel Time (s)		7.4			5.5			5.6			5.7	
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.67	0.67	0.67	0.82	0.82	0.82
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	43	628	5	34	466	23	149	60	343	6	24	183
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	676	0	0	523	0	0	552	0	0	213	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 89.7%		ICU Level of Service E	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	312.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	40	590	5	30	410	20	100	40	230	5	20	150
Future Vol, veh/h	40	590	5	30	410	20	100	40	230	5	20	150
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	88	88	88	67	67	67	82	82	82
Heavy Vehicles, %	1	1	1	2	2	2	0	0	0	0	0	0
Mvmt Flow	43	628	5	34	466	23	149	60	343	6	24	183

Major/Minor	Major1			Major2			Minor2			Minor1		
Conflicting Flow All	489	0	0	633	0	0	1366	1265	478	1293	1274	631
Stage 1	-	-	-	-	-	-	546	546	-	717	717	-
Stage 2	-	-	-	-	-	-	820	719	-	576	557	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1079	-	-	950	-	-	~ 126	171	591	141	169	485
Stage 1	-	-	-	-	-	-	526	521	-	424	437	-
Stage 2	-	-	-	-	-	-	372	436	-	506	515	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1079	-	-	950	-	-	~ 63	153	591	38	151	485
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 63	153	-	38	151	-
Stage 1	-	-	-	-	-	-	493	495	-	398	410	-
Stage 2	-	-	-	-	-	-	204	409	-	177	490	-

Approach	EB	WB	SE	NW
HCM Control Delay, s	0.5	0.6	$ 1094.7	40.2
HCM LOS			F	E

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	WBL	WBT	WBR	SELn1
Capacity (veh/h)	305	1079	-	-	950	-	-	167
HCM Lane V/C Ratio	0.7	0.039	-	-	0.036	-	-	3.307
HCM Control Delay (s)	40.2	8.5	0	-	8.9	0	-	$ 1094.7
HCM Lane LOS	E	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	4.9	0.1	-	-	0.1	-	-	52.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	80	330	140	560	530	0	320	500	120	50	290	590
Future Volume (vph)	80	330	140	560	530	0	320	500	120	50	290	590
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	3539		1770	1863	1583	1787	1881	1599
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	3539		1770	1863	1583	1787	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.96	0.96	0.96	0.95	0.95	0.95
Adj. Flow (vph)	87	359	152	596	564	0	333	521	125	53	305	621
RTOR Reduction (vph)	0	0	126	0	0	0	0	0	82	0	0	89
Lane Group Flow (vph)	87	359	26	596	564	0	333	521	43	53	305	532
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6		7	4		3	8	1
Permitted Phases			2						4			8
Actuated Green, G (s)	8.3	18.6	18.6	22.1	32.4		23.4	37.6	37.6	7.7	21.9	44.0
Effective Green, g (s)	8.3	18.6	18.6	22.1	32.4		23.4	37.6	37.6	7.7	21.9	44.0
Actuated g/C Ratio	0.08	0.17	0.17	0.20	0.29		0.21	0.34	0.34	0.07	0.20	0.40
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	133	598	267	689	1042		376	636	541	125	374	726
v/s Ratio Prot	0.05	0.10		c0.17	c0.16		c0.19	c0.28		0.03	0.16	c0.15
v/s Ratio Perm			0.02						0.03			0.19
v/c Ratio	0.65	0.60	0.10	0.87	0.54		0.89	0.82	0.08	0.42	0.82	0.73
Uniform Delay, d1	49.5	42.3	38.6	42.5	32.6		42.0	33.1	24.5	49.0	42.1	28.0
Progression Factor	1.00	1.00	1.00	1.32	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.0	4.4	0.7	10.2	0.5		21.2	8.1	0.1	2.3	12.8	3.8
Delay (s)	60.5	46.7	39.3	66.5	33.1		63.2	41.2	24.6	51.3	54.9	31.8
Level of Service	E	D	D	E	C		E	D	C	D	D	C
Approach Delay (s)		46.8			50.3			46.6			40.1	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	290	110	680	520	90	640
Future Volume (vph)	290	110	680	520	90	640
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	180	0		0	180	
Storage Lanes	1	1		1	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.850		0.850		
Flt Protected	0.950					0.994
Satd. Flow (prot)	1787	1599	1881	1599	0	3553
Flt Permitted	0.950					0.994
Satd. Flow (perm)	1787	1599	1881	1599	0	3553
Link Speed (mph)	30		30			30
Link Distance (ft)	403		387			233
Travel Time (s)	9.2		8.8			5.3
Peak Hour Factor	0.86	0.86	0.96	0.96	0.85	0.85
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	337	128	708	542	106	753
Shared Lane Traffic (%)						
Lane Group Flow (vph)	337	128	708	542	0	859
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 82.2%		ICU Level of Service E	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	101.7

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	290	110	680	520	90	640
Future Vol, veh/h	290	110	680	520	90	640
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	180	0	-	0	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	86	86	96	96	85	85
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	337	128	708	542	106	753

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1297	708	0	0	708	0
Stage 1	708	-	-	-	-	-
Stage 2	589	-	-	-	-	-
Critical Hdwy	6.615	6.215	-	-	4.115	-
Critical Hdwy Stg 1	5.415	-	-	-	-	-
Critical Hdwy Stg 2	5.815	-	-	-	-	-
Follow-up Hdwy	3.5095	3.3095	-	-	2.2095	-
Pot Cap-1 Maneuver	~ 167	436	-	-	894	-
Stage 1	490	-	-	-	-	-
Stage 2	521	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 133	436	-	-	894	-
Mov Cap-2 Maneuver	~ 133	-	-	-	-	-
Stage 1	390	-	-	-	-	-
Stage 2	521	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	$ 559.3	0	1.9
HCM LOS	F		

Minor Lane/Major Mvmt	NET	NER	NWLn1	NWLn2	SWL	SWT
Capacity (veh/h)	-	-	133	436	894	-
HCM Lane V/C Ratio	-	-	2.535	0.293	0.118	-
HCM Control Delay (s)	-	-	$ 765.1	16.6	9.6	0.8
HCM Lane LOS	-	-	F	C	A	A
HCM 95th %tile Q(veh)	-	-	29.8	1.2	0.4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	90	1225	5	20	1030	100	15	10	15	10	10	30
Future Volume (vph)	90	1225	5	20	1030	100	15	10	15	10	10	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1787	3572		1787	3527			1844	1615		1835	1599
Flt Permitted	0.95	1.00		0.95	1.00			0.80	1.00		0.83	1.00
Satd. Flow (perm)	1787	3572		1787	3527			1518	1615		1557	1599
Peak-hour factor, PHF	0.97	0.97	0.97	0.95	0.95	0.95	0.90	0.90	0.90	0.80	0.80	0.80
Adj. Flow (vph)	93	1263	5	21	1084	105	17	11	17	12	12	38
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	16	0	0	36
Lane Group Flow (vph)	93	1268	0	21	1185	0	0	28	1	0	26	2
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4	4	4
Actuated Green, G (s)	9.7	82.4		3.2	75.9			6.4	6.4		6.4	6.4
Effective Green, g (s)	9.7	82.4		3.2	75.9			6.4	6.4		6.4	6.4
Actuated g/C Ratio	0.09	0.75		0.03	0.69			0.06	0.06		0.06	0.06
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	157	2675		51	2433			88	93		90	93
v/s Ratio Prot	c0.05	c0.35		0.01	0.34							
v/s Ratio Perm								c0.02	0.00		0.02	0.00
v/c Ratio	0.59	0.47		0.41	0.49			0.32	0.01		0.29	0.02
Uniform Delay, d1	48.2	5.4		52.5	8.0			49.7	48.8		49.6	48.9
Progression Factor	0.99	1.64		1.00	1.13			1.00	1.00		1.00	1.00
Incremental Delay, d2	5.0	0.5		3.6	0.5			2.1	0.0		1.8	0.1
Delay (s)	52.7	9.3		56.1	9.5			51.8	48.9		51.4	49.0
Level of Service	D	A		E	A			D	D		D	D
Approach Delay (s)		12.3			10.3			50.7			49.9	
Approach LOS		B			B			D			D	

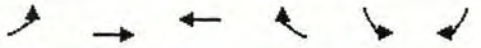
Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	530	1270	5	5	1080	70	40	10	10	80	5	490
Future Volume (vph)	530	1270	5	5	1080	70	40	10	10	80	5	490
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99		1.00	0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	3467	3572		1770	3507		1805	1758			1815	1615
Flt Permitted	0.95	1.00		0.95	1.00		0.69	1.00			0.72	1.00
Satd. Flow (perm)	3467	3572		1770	3507		1317	1758			1368	1615
Peak-hour factor, PHF	0.84	0.84	0.84	0.90	0.90	0.90	0.78	0.78	0.78	0.86	0.86	0.86
Adj. Flow (vph)	631	1512	6	6	1200	78	51	13	13	93	6	570
RTOR Reduction (vph)	0	0	0	0	4	0	0	11	0	0	0	18
Lane Group Flow (vph)	631	1518	0	6	1274	0	51	15	0	0	99	552
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases							8	8		4		4
Actuated Green, G (s)	29.0	77.3		1.4	49.7		13.3	13.3			13.3	42.3
Effective Green, g (s)	29.0	77.3		1.4	49.7		13.3	13.3			13.3	42.3
Actuated g/C Ratio	0.26	0.70		0.01	0.45		0.12	0.12			0.12	0.38
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	914	2510		22	1584		159	212			165	709
v/s Ratio Prot	0.18	0.42		0.00	c0.36			0.01				c0.21
v/s Ratio Perm							0.04				0.07	0.14
v/c Ratio	0.69	0.60		0.27	0.80		0.32	0.07			0.60	0.78
Uniform Delay, d1	36.5	8.5		53.8	26.0		44.2	42.9			45.8	29.7
Progression Factor	1.00	1.00		0.81	1.59		1.00	1.00			1.00	1.00
Incremental Delay, d2	2.3	1.1		6.2	2.9		1.2	0.1			5.8	5.4
Delay (s)	38.7	9.5		50.0	44.0		45.4	43.0			51.6	35.1
Level of Service	D	A		D	D		D	D			D	D
Approach Delay (s)		18.1			44.1			44.6			37.5	
Approach LOS		B			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	210	1870	1510	30	10	70
Future Volume (vph)	210	1870	1510	30	10	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			0	0	175
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.997			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3529	0	1752	1568
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	3539	3529	0	1752	1568
Link Speed (mph)		30	30		30	
Link Distance (ft)		535	210		522	
Travel Time (s)		12.2	4.8		11.9	
Peak Hour Factor	0.91	0.91	0.90	0.90	0.75	0.75
Heavy Vehicles (%)	2%	2%	2%	2%	3%	3%
Adj. Flow (vph)	231	2055	1678	33	13	93
Shared Lane Traffic (%)						
Lane Group Flow (vph)	231	2055	1711	0	13	93
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 67.7%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	14.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	210	1870	1510	30	10	70
Future Vol, veh/h	210	1870	1510	30	10	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	-	0	175
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	90	90	75	75
Heavy Vehicles, %	2	2	2	2	3	3
Mvmt Flow	231	2055	1678	33	13	93

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1711	0	-	0	3185	856
Stage 1	-	-	-	-	1695	-
Stage 2	-	-	-	-	1490	-
Critical Hdwy	4.14	-	-	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	5.86	-
Follow-up Hdwy	2.22	-	-	-	3.53	3.33
Pot Cap-1 Maneuver	367	-	-	-	~ 8	299
Stage 1	-	-	-	-	133	-
Stage 2	-	-	-	-	172	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	367	-	-	-	~ 3	299
Mov Cap-2 Maneuver	-	-	-	-	~ 3	-
Stage 1	-	-	-	-	49	-
Stage 2	-	-	-	-	172	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	$ 483.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	367	-	-	-	3	299
HCM Lane V/C Ratio	0.629	-	-	-	4.444	0.312
HCM Control Delay (s)	30	-	-	-	$ 3712.2	22.4
HCM Lane LOS	D	-	-	-	F	C
HCM 95th %tile Q(veh)	4.1	-	-	-	3	1.3

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	220	340	20	80	140	80	5	10	290	210	30
Future Volume (vph)	10	220	340	20	80	140	80	5	10	290	210	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.918				0.962					0.992	
Flt Protected		0.981				0.987					0.973	
Satd. Flow (prot)	0	1694	0	0	0	1769	0	0	0	0	1816	0
Flt Permitted		0.981				0.987					0.973	
Satd. Flow (perm)	0	1694	0	0	0	1769	0	0	0	0	1816	0
Link Speed (mph)		30				30					30	
Link Distance (ft)		449				456					370	
Travel Time (s)		10.2				10.4					8.4	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.87	0.87	0.87	0.87	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%	2%	2%	1%	1%	1%	1%
Adj. Flow (vph)	11	242	374	22	92	161	92	6	11	315	228	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	649	0	0	0	351	0	0	0	0	587	0
Sign Control		Yield				Yield					Yield	

Intersection Summary			
Area Type:	Other		
Control Type: Roundabout			
Intersection Capacity Utilization 124.5%		ICU Level of Service H	
Analysis Period (min) 15			

Lane Group	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR
Lane Configurations								
Traffic Volume (vph)	30	80	310	50	5	30	100	10
Future Volume (vph)	30	80	310	50	5	30	100	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.897					0.991	
Flt Protected		0.997					0.988	
Satd. Flow (prot)	0	1682	0	0	0	0	1824	0
Flt Permitted		0.997					0.988	
Satd. Flow (perm)	0	1682	0	0	0	0	1824	0
Link Speed (mph)		30					30	
Link Distance (ft)		390					523	
Travel Time (s)		8.9					11.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%	2%	2%
Adj. Flow (vph)	33	89	344	56	5	33	110	11
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	522	0	0	0	0	159	0
Sign Control		Yield					Yield	

Intersection Summary

Intersection	
Intersection Delay, s/veh	18.9
Intersection LOS	C

Approach	WB	NB	SB	NE	SW
Entry Lanes	1	1	1	1	1
Conflicting Circle Lanes	1	1	1	1	1
Adj Approach Flow, veh/h	649	351	587	522	159
Demand Flow Rate, veh/h	655	358	592	527	162
Vehicles Circulating, veh/h	486	804	500	609	924
Vehicles Exiting, veh/h	676	332	586	483	217
Ped Vol Crossing Leg, #/h	0	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000	1.000
Approach Delay, s/veh	21.7	17.3	18.1	19.6	11.3
Approach LOS	C	C	C	C	B

Lane	Left	Left	Left	Left	Left
Designated Moves	LR	LTR	LTR	LTR	LTR
Assumed Moves	LR	LTR	LTR	LTR	LTR
RT Channelized					
Lane Util	1.000	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
Entry Flow, veh/h	655	358	592	527	162
Cap Entry Lane, veh/h	841	608	829	741	538
Entry HV Adj Factor	0.991	0.980	0.991	0.991	0.980
Flow Entry, veh/h	649	351	587	522	159
Cap Entry, veh/h	833	595	821	735	527
V/C Ratio	0.779	0.589	0.714	0.711	0.301
Control Delay, s/veh	21.7	17.3	18.1	19.6	11.3
LOS	C	C	C	C	B
95th %tile Queue, veh	8	4	6	6	1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	50	425	5	30	20	320	190	10	10	110	10
Future Volume (vph)	10	50	425	5	30	20	320	190	10	10	110	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.952			0.997			0.990	
Flt Protected		0.992			0.996			0.970			0.996	
Satd. Flow (prot)	0	1848	1583	0	1802	0	0	1819	0	0	1855	0
Flt Permitted		0.992			0.996			0.970			0.996	
Satd. Flow (perm)	0	1848	1583	0	1802	0	0	1819	0	0	1855	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		168			453			475			436	
Travel Time (s)		3.8			10.3			10.8			9.9	
Peak Hour Factor	0.88	0.88	0.88	0.82	0.82	0.82	0.93	0.93	0.93	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	11	57	483	6	37	24	344	204	11	11	121	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	68	483	0	67	0	0	559	0	0	143	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	11.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		✣			✣			✣	
Traffic Vol, veh/h	10	50	425	5	30	20	320	190	10	10	110	10
Future Vol, veh/h	10	50	425	5	30	20	320	190	10	10	110	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	82	82	82	93	93	93	91	91	91
Heavy Vehicles, %	2	2	2	0	0	0	1	1	1	1	1	1
Mvmt Flow	11	57	483	6	37	24	344	204	11	11	121	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1077	1052	127	1317	1052	210	132	0	0	215	0	0
Stage 1	149	149	-	898	898	-	-	-	-	-	-	-
Stage 2	928	903	-	419	154	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	197	227	923	136	228	835	1459	-	-	1361	-	-
Stage 1	854	774	-	337	361	-	-	-	-	-	-	-
Stage 2	321	356	-	616	774	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	126	165	923	38	165	835	1459	-	-	1361	-	-
Mov Cap-2 Maneuver	126	165	-	38	165	-	-	-	-	-	-	-
Stage 1	625	767	-	247	264	-	-	-	-	-	-	-
Stage 2	196	261	-	269	767	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17	41.7	5.1	0.6
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1459	-	-	157	923	163	1361	-	-
HCM Lane V/C Ratio	0.236	-	-	0.434	0.523	0.411	0.008	-	-
HCM Control Delay (s)	8.2	0	-	44.5	13.1	41.7	7.7	0	-
HCM Lane LOS	A	A	-	E	B	E	A	A	-
HCM 95th %tile Q(veh)	0.9	-	-	2	3.1	1.8	0	-	-

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	70	30	30	30	50	40	660	70	20	180	30
Future Volume (vph)	30	70	30	30	30	50	40	660	70	20	180	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1780		1787	1881	1599	1805	1873		1805	1860	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1780		1787	1881	1599	1805	1873		1805	1860	
Peak-hour factor, PHF	0.99	0.99	0.99	0.95	0.95	0.95	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	30	71	30	32	32	53	45	742	79	22	194	32
RTOR Reduction (vph)	0	19	0	0	0	39	0	5	0	0	7	0
Lane Group Flow (vph)	30	82	0	32	32	14	45	816	0	22	219	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases		6			2							
Actuated Green, G (s)	1.6	8.3		1.6	8.3	18.7	4.4	34.8		2.4	32.8	
Effective Green, g (s)	1.6	8.3		1.6	8.3	18.7	4.4	34.8		2.4	32.8	
Actuated g/C Ratio	0.02	0.12		0.02	0.12	0.26	0.06	0.49		0.03	0.46	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	39	207		40	219	420	111	916		60	858	
v/s Ratio Prot	0.02	c0.05		c0.02	0.02	0.01	c0.02	c0.44		0.01	0.12	
v/s Ratio Perm												
v/c Ratio	0.77	0.40		0.80	0.15	0.03	0.41	0.89		0.37	0.26	
Uniform Delay, d1	34.6	29.1		34.6	28.2	19.5	32.1	16.4		33.6	11.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	60.6	1.3		69.2	1.4	0.0	2.4	10.9		3.8	0.2	
Delay (s)	95.2	30.3		103.8	29.6	19.5	34.5	27.3		37.4	11.9	
Level of Service	F	C		F	C	B	C	C		D	B	
Approach Delay (s)		45.2			45.3			27.7			14.1	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	71.1	Sum of lost time (s)	24.0
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	700	10	40	130	130	650
Future Volume (vph)	700	10	40	130	130	650
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	4.0	4.0	6.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	0.95		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1772		1626	1712	1863	1583
Flt Permitted	0.95		0.60	1.00	1.00	1.00
Satd. Flow (perm)	1772		1020	1712	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.91	0.91	0.82	0.82
Adj. Flow (vph)	745	11	44	143	159	793
RTOR Reduction (vph)	1	0	0	0	0	173
Lane Group Flow (vph)	755	0	44	143	159	620
Heavy Vehicles (%)	2%	2%	11%	11%	2%	2%
Turn Type	Prot		pm+pt	NA	NA	custom
Protected Phases	8		1	6 7	2 7	7 8
Permitted Phases			6 7			2
Actuated Green, G (s)	40.4		27.7	24.9	24.9	67.3
Effective Green, g (s)	40.4		23.7	24.9	24.9	67.3
Actuated g/C Ratio	0.47		0.28	0.29	0.29	0.78
Clearance Time (s)	6.0		6.0			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap (vph)	831		300	495	538	1237
v/s Ratio Prot	c0.43		c0.00	0.08	0.09	c0.32
v/s Ratio Perm			0.04			0.07
v/c Ratio	0.91		0.15	0.29	0.30	0.50
Uniform Delay, d1	21.2		23.3	23.7	23.8	3.4
Progression Factor	1.00		1.00	1.00	1.06	1.66
Incremental Delay, d2	13.6		0.2	0.3	0.3	0.3
Delay (s)	34.8		23.5	24.1	25.4	5.9
Level of Service	C		C	C	C	A
Approach Delay (s)	34.8			23.9	9.1	
Approach LOS	C			C	A	

Intersection Summary			
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	86.1	Sum of lost time (s)	22.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations			↰↰		↰↰	
Traffic Volume (vph)	0	0	1405	0	410	0
Future Volume (vph)	0	0	1405	0	410	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0		6.0	
Lane Util. Factor			0.97		0.97	
Frt			1.00		1.00	
Flt Protected			0.95		0.95	
Satd. Flow (prot)			3433		3433	
Flt Permitted			0.95		0.95	
Satd. Flow (perm)			3433		3433	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	1495	0	436	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	1495	0	436	0
Turn Type			Prot		Prot	
Protected Phases			4		2	
Permitted Phases						
Actuated Green, G (s)			57.0		21.0	
Effective Green, g (s)			57.0		21.0	
Actuated g/C Ratio			0.63		0.23	
Clearance Time (s)			6.0		6.0	
Vehicle Extension (s)			3.0		3.0	
Lane Grp Cap (vph)			2174		801	
v/s Ratio Prot			c0.44		c0.13	
v/s Ratio Perm						
v/c Ratio			0.69		0.54	
Uniform Delay, d1			10.7		30.3	
Progression Factor			1.00		1.17	
Incremental Delay, d2			1.8		2.6	
Delay (s)			12.5		38.1	
Level of Service			B		D	
Approach Delay (s)	0.0			12.5	38.1	
Approach LOS	A			B	D	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	112.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBR	NWL	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations										
Traffic Volume (vph)	0	0	0	225	0	1405	0	0	410	1090
Future Volume (vph)	0	0	0	225	0	1405	0	0	410	1090
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0	6.0		6.0			6.0	6.0
Lane Util. Factor			1.00	0.95		0.95			0.95	0.88
Frt			0.85	0.85		1.00			1.00	0.85
Flt Protected			1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)			1583	1504		3539			3539	2787
Flt Permitted			1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)			1583	1504		3539			3539	2787
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	239	0	1495	0	0	436	1160
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	133
Lane Group Flow (vph)	0	0	120	119	0	1495	0	0	436	1027
Turn Type			Prot	Prot	Perm	NA			NA	Perm
Protected Phases			4	4		2			2	
Permitted Phases					2					2
Actuated Green, G (s)			13.3	13.3		64.7			64.7	64.7
Effective Green, g (s)			13.3	13.3		64.7			64.7	64.7
Actuated g/C Ratio			0.15	0.15		0.72			0.72	0.72
Clearance Time (s)			6.0	6.0		6.0			6.0	6.0
Vehicle Extension (s)			3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)			233	222		2544			2544	2003
v/s Ratio Prot			0.08	c0.08		c0.42			0.12	
v/s Ratio Perm										0.37
v/c Ratio			0.52	0.54		0.59			0.17	0.51
Uniform Delay, d1			35.4	35.5		6.2			4.1	5.6
Progression Factor			1.00	1.00		0.45			1.00	1.00
Incremental Delay, d2			1.9	2.5		0.7			0.1	0.9
Delay (s)			37.3	38.0		3.5			4.2	6.6
Level of Service			D	D		A			A	A
Approach Delay (s)	0.0		37.6			3.5			5.9	
Approach LOS	A		D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	460	5	10	490	10	5	60	10	10	60	70
Future Volume (vph)	60	460	5	10	490	10	5	60	10	10	60	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1860		1770	1857		1770	1822		1770	1863	1583
Flt Permitted	0.22	1.00		0.36	1.00		0.71	1.00		0.71	1.00	1.00
Satd. Flow (perm)	415	1860		664	1857		1331	1822		1318	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	500	5	11	533	11	5	65	11	11	65	76
RTOR Reduction (vph)	0	1	0	0	1	0	0	8	0	0	0	49
Lane Group Flow (vph)	65	504	0	11	543	0	5	68	0	11	65	27
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	34.8	30.9		29.0	28.0		22.1	22.1		22.1	22.1	26.0
Effective Green, g (s)	34.8	30.9		29.0	28.0		22.1	22.1		22.1	22.1	26.0
Actuated g/C Ratio	0.48	0.43		0.40	0.39		0.31	0.31		0.31	0.31	0.36
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	273	798		282	722		408	559		404	571	703
v/s Ratio Prot	c0.01	c0.27		0.00	c0.29			c0.04			0.03	0.00
v/s Ratio Perm	0.10			0.02			0.00			0.01		0.02
v/c Ratio	0.24	0.63		0.04	0.75		0.01	0.12		0.03	0.11	0.04
Uniform Delay, d1	11.9	16.1		13.3	19.0		17.4	18.0		17.4	17.9	14.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	3.8		0.1	4.4		0.1	0.4		0.0	0.1	0.0
Delay (s)	12.3	19.9		13.3	23.4		17.4	18.4		17.5	18.0	14.9
Level of Service	B	B		B	C		B	B		B	B	B
Approach Delay (s)		19.0			23.2			18.4			16.4	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	410	0	250	440	0	300
Future Volume (vph)	410	0	250	440	0	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	80
Storage Lanes		0	0		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850
Flt Protected				0.982		
Satd. Flow (prot)	1863	0	0	1829	1863	1583
Flt Permitted				0.982		
Satd. Flow (perm)	1863	0	0	1829	1863	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	410			475	676	
Travel Time (s)	9.3			10.8	15.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	446	0	272	478	0	326
Shared Lane Traffic (%)						
Lane Group Flow (vph)	446	0	0	750	0	326
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 65.2%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	5.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↰	↱
Traffic Vol, veh/h	410	0	250	440	0	300
Future Vol, veh/h	410	0	250	440	0	300
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	80
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	446	0	272	478	0	326

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	446	0	1468	446
Stage 1	-	-	-	-	446	-
Stage 2	-	-	-	-	1022	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1114	-	141	612
Stage 1	-	-	-	-	645	-
Stage 2	-	-	-	-	347	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1114	-	94	612
Mov Cap-2 Maneuver	-	-	-	-	94	-
Stage 1	-	-	-	-	430	-
Stage 2	-	-	-	-	347	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.4	17.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	612	-	-	1114	-
HCM Lane V/C Ratio	-	0.533	-	-	0.244	-
HCM Control Delay (s)	0	17.4	-	-	9.3	0
HCM Lane LOS	A	C	-	-	A	A
HCM 95th %tile Q(veh)	-	3.1	-	-	1	-

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	125	1510	1425	290	120	75
Future Volume (vph)	125	1510	1425	290	120	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.09	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	174	3539	3539	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	136	1641	1549	315	130	82
RTOR Reduction (vph)	0	0	0	83	0	14
Lane Group Flow (vph)	136	1641	1549	232	130	68
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	4	4	5
Permitted Phases	2			6		4
Actuated Green, G (s)	46.4	46.4	36.7	47.0	10.3	14.0
Effective Green, g (s)	46.4	46.4	36.7	47.0	10.3	14.0
Actuated g/C Ratio	0.68	0.68	0.53	0.68	0.15	0.20
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	203	2390	1890	1221	265	460
v/s Ratio Prot	0.04	c0.46	c0.44	0.03	c0.07	0.01
v/s Ratio Perm	0.41			0.12		0.04
v/c Ratio	0.67	0.69	0.82	0.19	0.49	0.15
Uniform Delay, d1	11.2	6.7	13.3	3.9	26.8	22.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.1	0.8	2.9	0.1	1.4	0.2
Delay (s)	19.3	7.6	16.2	4.0	28.2	22.6
Level of Service	B	A	B	A	C	C
Approach Delay (s)		8.5	14.1		26.1	
Approach LOS		A	B		C	

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	68.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	70	10	680	150	30	710
Future Volume (vph)	70	10	680	150	30	710
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0	4.0	6.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1769		1900	1615	1805	1900
Flt Permitted	0.96		1.00	1.00	0.31	1.00
Satd. Flow (perm)	1769		1900	1615	594	1900
Peak-hour factor, PHF	0.87	0.67	0.95	0.84	0.73	0.96
Adj. Flow (vph)	80	15	716	179	41	740
RTOR Reduction (vph)	7	0	0	48	0	0
Lane Group Flow (vph)	88	0	716	131	41	740
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Turn Type	Prot		NA	Perm	custom	NA
Protected Phases	7		6 8		5	2 8
Permitted Phases				6 8	2	
Actuated Green, G (s)	8.1		53.2	53.2	15.6	53.2
Effective Green, g (s)	8.1		53.2	53.2	15.6	53.2
Actuated g/C Ratio	0.09		0.62	0.62	0.18	0.62
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	166		1173	997	147	1173
v/s Ratio Prot	c0.05		0.38		c0.01	c0.39
v/s Ratio Perm				0.08	0.04	
v/c Ratio	0.53		0.61	0.13	0.28	0.63
Uniform Delay, d1	37.2		10.1	6.8	30.0	10.3
Progression Factor	1.00		0.24	0.23	1.00	1.00
Incremental Delay, d2	3.0		0.6	0.0	1.0	1.1
Delay (s)	40.2		3.0	1.6	31.0	11.4
Level of Service	D		A	A	C	B
Approach Delay (s)	40.2		2.7			12.4
Approach LOS	D		A			B

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	86.1	Sum of lost time (s)	22.0
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	10	30	660	730	10
Future Volume (vph)	10	10	30	660	730	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.939				0.998	
Flt Protected	0.973		0.950			
Satd. Flow (prot)	1736	0	1787	1900	1878	0
Flt Permitted	0.973		0.950			
Satd. Flow (perm)	1736	0	1787	1900	1878	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	332			288	365	
Travel Time (s)	7.5			6.5	8.3	
Peak Hour Factor	0.64	0.77	0.71	0.90	0.75	0.55
Heavy Vehicles (%)	0%	0%	1%	0%	1%	0%
Adj. Flow (vph)	16	13	42	733	973	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	29	0	42	733	991	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 49.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.9

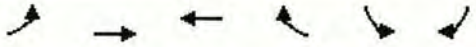
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	10	30	660	730	10
Future Vol, veh/h	10	10	30	660	730	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	64	77	71	90	75	55
Heavy Vehicles, %	0	0	1	0	1	0
Mvmt Flow	16	13	42	733	973	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1799	982	991	0	-	0
Stage 1	982	-	-	-	-	-
Stage 2	817	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	89	305	702	-	-	-
Stage 1	366	-	-	-	-	-
Stage 2	438	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	84	305	702	-	-	-
Mov Cap-2 Maneuver	84	-	-	-	-	-
Stage 1	344	-	-	-	-	-
Stage 2	438	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	42.1	0.6	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	702	-	125	-	-
HCM Lane V/C Ratio	0.06	-	0.229	-	-
HCM Control Delay (s)	10.5	-	42.1	-	-
HCM Lane LOS	B	-	E	-	-
HCM 95th %tile Q(veh)	0.2	-	0.8	-	-

APPENDIX Q-2: ALTERNATIVE C INTERSECTION CAPACITY ANALYSES – HCS PRINTSOUTS – PM PEAK HOUR



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1345	715	0	115	1010
Future Volume (vph)	0	1345	715	0	115	1010
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		0.95	0.95		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3406		1930	2682
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3406		1930	2682
Peak-hour factor, PHF	0.93	0.93	0.88	0.88	0.89	0.89
Adj. Flow (vph)	0	1446	812	0	129	1135
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1446	813	0	129	1135
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		32.0	32.0		31.0	31.0
Effective Green, g (s)		32.0	32.0		31.0	31.0
Actuated g/C Ratio		0.43	0.43		0.41	0.41
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1480	1453		797	1108
v/s Ratio Prot		c0.42	0.24		0.07	c0.42
v/s Ratio Perm						
v/c Ratio		0.98	0.56		0.16	1.02
Uniform Delay, d1		21.1	16.2		13.8	22.0
Progression Factor		1.00	1.23		1.00	1.00
Incremental Delay, d2		10.9	0.1		0.1	33.4
Delay (s)		32.0	20.0		13.9	55.4
Level of Service		C	B		B	E
Approach Delay (s)		32.0	20.0		51.2	
Approach LOS		C	B		D	

Intersection Summary			
HCM 2000 Control Delay	36.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	455	0	300	0	0	1350	110	0	0	990	375
Future Volume (vph)	455	0	300	0	0	1350	110	0	0	990	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0	6.0			6.0	4.0
Lane Util. Factor	0.97		0.88			0.97	0.95			0.95	1.00
Frt	1.00		0.85			1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)	3242		2632			3335	3438			3505	1568
Flt Permitted	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (perm)	3242		2632			3335	3438			3505	1568
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	517	0	341	0	0	1436	117	0	0	1076	408
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	517	0	341	0	0	1436	117	0	0	1076	408
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Actuated Green, G (s)	23.0		23.0			63.0	115.0			46.0	150.0
Effective Green, g (s)	23.0		23.0			63.0	115.0			46.0	150.0
Actuated g/C Ratio	0.15		0.15			0.42	0.77			0.31	1.00
Clearance Time (s)	6.0		6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	497		403			1400	2635			1074	1568
v/s Ratio Prot	c0.16		0.13			c0.43	0.03			c0.31	
v/s Ratio Perm											0.26
v/c Ratio	1.04		0.85			1.03	0.04			1.00	0.26
Uniform Delay, d1	63.5		61.8			43.5	4.2			52.0	0.0
Progression Factor	1.00		1.00			0.59	1.90			1.00	1.00
Incremental Delay, d2	51.2		15.0			22.4	0.0			27.9	0.4
Delay (s)	114.7		76.8			48.2	8.0			79.9	0.4
Level of Service	F		E			D	A			E	A
Approach Delay (s)		99.6		0.0			45.2			58.1	
Approach LOS		F		A			D			E	

Intersection Summary			
HCM 2000 Control Delay	62.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2: Exit 5 SB On/Exit 5 SB Off & NH 28

12/27/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	575	470	280	730	0	0	0	0	105	0	360
Future Volume (vph)	0	575	470	280	730	0	0	0	0	105	0	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3167	1417	1687	3374					3303		1524
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3167	1417	1687	3374					3303		1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.73	0.73	0.73	0.92	0.92	0.92	0.74	0.74	0.74
Adj. Flow (vph)	0	625	511	384	1000	0	0	0	0	142	0	486
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	79
Lane Group Flow (vph)	0	625	511	384	1000	0	0	0	0	142	0	407
Heavy Vehicles (%)	14%	14%	14%	7%	7%	7%	2%	2%	2%	6%	6%	6%
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Actuated Green, G (s)		31.6	110.0	28.1	65.7					32.3		32.3
Effective Green, g (s)		31.6	110.0	28.1	65.7					32.3		32.3
Actuated g/C Ratio		0.29	1.00	0.26	0.60					0.29		0.29
Clearance Time (s)		6.0		6.0	6.0					6.0		6.0
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Lane Grp Cap (vph)		909	1417	430	2015					969		447
v/s Ratio Prot		c0.20		c0.23	0.30					0.04		c0.27
v/s Ratio Perm			0.36									
v/c Ratio		0.69	0.36	0.89	0.50					0.15		0.91
Uniform Delay, d1		34.8	0.0	39.5	12.7					28.7		37.5
Progression Factor		1.00	1.00	0.38	0.10					1.00		1.00
Incremental Delay, d2		4.2	0.7	17.4	0.5					0.1		22.5
Delay (s)		39.0	0.7	32.5	1.7					28.7		59.9
Level of Service		D	A	C	A					C		E
Approach Delay (s)		21.8			10.3			0.0			52.9	
Approach LOS		C			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	480	200	0	0	595	340	415	0	160	0	0	0
Future Volume (vph)	480	200	0	0	595	340	415	0	160	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1641	3282			3438	1538	1656		1482			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1641	3282			3438	1538	1656		1482			
Peak-hour factor, PHF	0.87	0.87	0.87	0.90	0.90	0.90	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	552	230	0	0	661	378	532	0	205	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	139	0	0	0
Lane Group Flow (vph)	552	230	0	0	661	378	532	0	66	0	0	0
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	9%	9%	9%	2%	2%	2%
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Actuated Green, G (s)	36.0	64.0			22.0	110.0	34.0		34.0			
Effective Green, g (s)	36.0	64.0			22.0	110.0	34.0		34.0			
Actuated g/C Ratio	0.33	0.58			0.20	1.00	0.31		0.31			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Lane Grp Cap (vph)	537	1909			687	1538	511		458			
v/s Ratio Prot	c0.34	0.07			c0.19		c0.32		0.04			
v/s Ratio Perm						0.25						
v/c Ratio	1.03	0.12			0.96	0.25	1.04		0.14			
Uniform Delay, d1	37.0	10.3			43.6	0.0	38.0		27.5			
Progression Factor	0.26	0.14			1.00	1.00	1.00		1.00			
Incremental Delay, d2	41.1	0.1			26.2	0.4	50.9		0.1			
Delay (s)	50.8	1.6			69.8	0.4	88.9		27.6			
Level of Service	D	A			E	A	F		C			
Approach Delay (s)		36.3			44.6			71.9			0.0	
Approach LOS		D			D			E			A	

Intersection Summary			
HCM 2000 Control Delay	49.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	0	170	0	0	0	100	450	5	5	1010	40
Future Volume (vph)	10	0	170	0	0	0	100	450	5	5	1010	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0				6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00				1.00	0.95		1.00	0.95	
Frt		1.00	0.85				1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1770	1583				1770	3534		1770	3519	
Flt Permitted		1.00	1.00				0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1863	1583				1770	3534		1770	3519	
Peak-hour factor, PHF	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	0	185	0	0	0	109	489	5	5	1098	43
RTOR Reduction (vph)	0	0	70	0	0	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	11	115	0	0	0	109	493	0	5	1139	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	custom				Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Actuated Green, G (s)		1.2	43.9				7.6	50.7		0.8	43.9	
Effective Green, g (s)		1.2	43.9				7.6	50.7		0.8	43.9	
Actuated g/C Ratio		0.02	0.62				0.11	0.72		0.01	0.62	
Clearance Time (s)		6.0	6.0				6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0				3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		31	982				190	2534		20	2185	
v/s Ratio Prot							c0.06	0.14		0.00	c0.32	
v/s Ratio Perm		c0.01	0.07									
v/c Ratio		0.35	0.12				0.57	0.19		0.25	0.52	
Uniform Delay, d1		34.4	5.5				30.0	3.3		34.7	7.5	
Progression Factor		1.00	1.00				1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.9	0.1				4.1	0.0		6.5	0.2	
Delay (s)		41.2	5.5				34.2	3.3		41.1	7.7	
Level of Service		D	A				C	A		D	A	
Approach Delay (s)		7.5			0.0			8.9			7.9	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	70.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	10	10	360	0	40	0	380	110	15	525	0
Future Volume (vph)	10	10	10	360	0	40	0	380	110	15	525	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.95			0.99			0.97			1.00	
Flt Protected		0.98			0.96			1.00			1.00	
Satd. Flow (prot)		1750			1741			1706			1807	
Flt Permitted		0.84			0.71			1.00			0.98	
Satd. Flow (perm)		1501			1293			1706			1774	
Peak-hour factor, PHF	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	17	17	17	375	0	42	0	427	124	17	610	0
RTOR Reduction (vph)	0	11	0	0	23	0	0	12	0	0	0	0
Lane Group Flow (vph)	0	40	0	0	394	0	0	539	0	0	627	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Actuated Green, G (s)		27.9			27.9			34.8			34.8	
Effective Green, g (s)		27.9			27.9			34.8			34.8	
Actuated g/C Ratio		0.37			0.37			0.47			0.47	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		560			482			794			826	
v/s Ratio Prot								0.32				
v/s Ratio Perm		0.03			c0.30						c0.35	
v/c Ratio		0.07			0.82			0.68			0.76	
Uniform Delay, d1		15.1			21.1			15.6			16.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			10.4			2.3			4.0	
Delay (s)		15.1			31.5			17.9			20.5	
Level of Service		B			C			B			C	
Approach Delay (s)		15.1			31.5			17.9			20.5	
Approach LOS		B			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	74.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	210	50	20	400	50	70	270	20	70	270	40
Future Volume (vph)	60	210	50	20	400	50	70	270	20	70	270	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1656	1693		1703	1763		1719	1790		1703	1792	1524
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1656	1693		1703	1763		1719	1790		1703	1792	1524
Peak-hour factor, PHF	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.91	0.91	0.91
Adj. Flow (vph)	62	219	52	21	426	53	82	318	24	77	297	44
RTOR Reduction (vph)	0	9	0	0	5	0	0	3	0	0	0	34
Lane Group Flow (vph)	63	262	0	21	474	0	82	339	0	77	297	10
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	5%	5%	5%	6%	6%	6%
Parking (#/hr)			0									
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	4.4	30.7		1.8	28.1		7.0	18.6		7.0	18.6	18.6
Effective Green, g (s)	4.4	30.7		1.8	28.1		7.0	18.6		7.0	18.6	18.6
Actuated g/C Ratio	0.05	0.37		0.02	0.34		0.09	0.23		0.09	0.23	0.23
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	88	633		37	603		146	405		145	405	345
v/s Ratio Prot	c0.04	c0.15		0.01	c0.27		c0.05	c0.19		0.05	0.17	
v/s Ratio Perm												0.01
v/c Ratio	0.72	0.41		0.57	0.79		0.56	0.84		0.53	0.73	0.03
Uniform Delay, d1	38.2	19.0		39.8	24.3		36.1	30.3		36.0	29.4	24.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	24.0	0.4		18.4	6.7		4.9	13.9		3.7	6.7	0.0
Delay (s)	62.3	19.5		58.2	31.0		40.9	44.2		39.7	36.2	24.8
Level of Service	E	B		E	C		D	D		D	D	C
Approach Delay (s)		27.5			32.1			43.6			35.6	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	82.1	Sum of lost time (s)	24.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	350	20	5	130	115	415
Future Volume (vph)	350	20	5	130	115	415
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	120	0			220
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.998		
Satd. Flow (prot)	1719	1538	0	1823	1863	1583
Flt Permitted	0.950			0.998		
Satd. Flow (perm)	1719	1538	0	1823	1863	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	322			309	292	
Travel Time (s)	7.3			7.0	6.6	
Peak Hour Factor	0.89	0.89	0.91	0.91	0.93	0.93
Heavy Vehicles (%)	5%	5%	4%	4%	2%	2%
Adj. Flow (vph)	393	22	5	143	124	446
Shared Lane Traffic (%)						
Lane Group Flow (vph)	393	22	0	148	124	446
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	21.1
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	350	20	5	130	115	415
Future Vol, veh/h	350	20	5	130	115	415
Peak Hour Factor	0.89	0.89	0.91	0.91	0.93	0.93
Heavy Vehicles, %	5	5	4	4	2	2
Mvmt Flow	393	22	5	143	124	446
Number of Lanes	1	1	0	1	1	1

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	2
HCM Control Delay	28.2	12.4	18.2
HCM LOS	D	B	C

Lane	NBLn1	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	4%	100%	0%	0%	0%
Vol Thru, %	96%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	135	350	20	115	415
LT Vol	5	350	0	0	0
Through Vol	130	0	0	115	0
RT Vol	0	0	20	0	415
Lane Flow Rate	148	393	22	124	446
Geometry Grp	4	7	7	7	7
Degree of Util (X)	0.277	0.766	0.036	0.217	0.694
Departure Headway (Hd)	6.722	7.011	5.795	6.311	5.6
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	531	515	616	566	643
Service Time	4.802	4.763	3.547	4.078	3.367
HCM Lane V/C Ratio	0.279	0.763	0.036	0.219	0.694
HCM Control Delay	12.4	29.3	8.8	10.8	20.2
HCM Lane LOS	B	D	A	B	C
HCM 95th-tile Q	1.1	6.8	0.1	0.8	5.5

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	0	10	470	530	0
Future Volume (vph)	10	0	10	470	530	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950			0.999		
Satd. Flow (prot)	1008	0	0	1825	1792	0
Flt Permitted	0.950			0.999		
Satd. Flow (perm)	1008	0	0	1825	1792	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	160			224	319	
Travel Time (s)	3.6			5.1	7.3	
Peak Hour Factor	0.44	0.44	0.95	0.95	0.96	0.96
Heavy Vehicles (%)	79%	79%	4%	4%	6%	6%
Adj. Flow (vph)	23	0	11	495	552	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	0	0	506	552	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 42.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	0	10	470	530	0
Future Vol, veh/h	10	0	10	470	530	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	44	44	95	95	96	96
Heavy Vehicles, %	79	79	4	4	6	6
Mvmt Flow	23	0	11	495	552	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1069	552	552	0	-	0
Stage 1	552	-	-	-	-	-
Stage 2	517	-	-	-	-	-
Critical Hdwy	7.19	6.99	4.14	-	-	-
Critical Hdwy Stg 1	6.19	-	-	-	-	-
Critical Hdwy Stg 2	6.19	-	-	-	-	-
Follow-up Hdwy	4.211	4.011	2.236	-	-	-
Pot Cap-1 Maneuver	177	411	1008	-	-	-
Stage 1	449	-	-	-	-	-
Stage 2	468	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	174	411	1008	-	-	-
Mov Cap-2 Maneuver	174	-	-	-	-	-
Stage 1	442	-	-	-	-	-
Stage 2	468	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.8	0.2	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1008	-	174	-	-
HCM Lane V/C Ratio	0.01	-	0.131	-	-
HCM Control Delay (s)	8.6	0	28.8	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	50	420	10	30	420	10	50	70	100	10	10	100
Future Volume (vph)	50	420	10	30	420	10	50	70	100	10	10	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	0		0	150		150
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.997			0.939			0.888	
Flt Protected		0.995			0.997			0.989			0.996	
Satd. Flow (prot)	0	1762	0	0	1799	0	0	1730	0	0	1680	0
Flt Permitted		0.995			0.997			0.989			0.996	
Satd. Flow (perm)	0	1762	0	0	1799	0	0	1730	0	0	1680	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		327			240			246			251	
Travel Time (s)		7.4			5.5			5.6			5.7	
Peak Hour Factor	0.89	0.89	0.89	0.96	0.96	0.96	0.65	0.65	0.65	0.67	0.67	0.67
Heavy Vehicles (%)	7%	7%	7%	5%	5%	5%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	56	472	11	31	438	10	77	108	154	15	15	149
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	539	0	0	479	0	0	339	0	0	179	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.8%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection												
Int Delay, s/veh	52 3											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	50	420	10	30	420	10	50	70	100	10	10	100
Future Vol, veh/h	50	420	10	30	420	10	50	70	100	10	10	100
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	96	96	96	65	65	65	67	67	67
Heavy Vehicles, %	7	7	7	5	5	5	2	2	2	0	0	0
Mvmt Flow	56	472	11	31	438	10	77	108	154	15	15	149

Major/Minor	Major1			Major2			Minor2			Minor1		
Conflicting Flow All	448	0	0	483	0	0	1177	1100	443	1149	1100	478
Stage 1	-	-	-	-	-	-	505	505	-	590	590	-
Stage 2	-	-	-	-	-	-	672	595	-	559	510	-
Critical Hdwy	4.17	-	-	4.15	-	-	7.12	6.52	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Follow-up Hdwy	2.263	-	-	2.245	-	-	3.518	4.018	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	1086	-	-	1064	-	-	168	212	615	177	214	591
Stage 1	-	-	-	-	-	-	549	540	-	497	498	-
Stage 2	-	-	-	-	-	-	445	492	-	517	541	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1086	-	-	1064	-	-	109	189	615	67	191	591
Mov Cap-2 Maneuver	-	-	-	-	-	-	109	189	-	67	191	-
Stage 1	-	-	-	-	-	-	510	519	-	462	463	-
Stage 2	-	-	-	-	-	-	299	457	-	295	520	-

Approach	EB	WB	SE	NW
HCM Control Delay, s	0.9	0.6	219.6	29
HCM LOS			F	D

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	WBL	WBT	WBR	SELn1
Capacity (veh/h)	324	1086	-	-	1064	-	-	251
HCM Lane V/C Ratio	0.553	0.052	-	-	0.029	-	-	1.348
HCM Control Delay (s)	29	8.5	0	-	8.5	0	-	219.6
HCM Lane LOS	D	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	3.2	0.2	-	-	0.1	-	-	18

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	220	115	345	270	0	190	280	20	40	370	530
Future Volume (vph)	20	220	115	345	270	0	190	280	20	40	370	530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	3471	1553	3335	3438		1752	1845	1568	1752	1845	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1736	3471	1553	3335	3438		1752	1845	1568	1752	1845	1568
Peak-hour factor, PHF	0.84	0.84	0.84	0.79	0.79	0.79	0.86	0.86	0.86	0.99	0.99	0.99
Adj. Flow (vph)	24	262	137	437	342	0	221	326	23	40	374	535
RTOR Reduction (vph)	0	0	113	0	0	0	0	0	0	0	0	95
Lane Group Flow (vph)	24	262	24	437	342	0	221	326	23	40	374	440
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	5	2		1	6		7	4		3	8	8 1
Permitted Phases		2	2		6			4	Free		8	
Actuated Green, G (s)	8.6	15.6	15.6	14.6	21.6		13.5	31.6	90.0	4.2	22.3	42.9
Effective Green, g (s)	8.6	15.6	15.6	14.6	21.6		13.5	31.6	90.0	4.2	22.3	42.9
Actuated g/C Ratio	0.10	0.17	0.17	0.16	0.24		0.15	0.35	1.00	0.05	0.25	0.48
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	165	601	269	541	825		262	647	1568	81	457	747
v/s Ratio Prot	0.01	0.08		c0.13	c0.10		c0.13	0.18		0.02	c0.20	0.28
v/s Ratio Perm			0.02						0.01			
v/c Ratio	0.15	0.44	0.09	0.81	0.41		0.84	0.50	0.01	0.49	0.82	0.59
Uniform Delay, d1	37.3	33.3	31.2	36.3	28.9		37.2	23.0	0.0	41.9	31.9	17.1
Progression Factor	1.00	1.00	1.00	0.91	0.70		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	2.3	0.6	8.3	1.5		21.2	0.6	0.0	4.7	10.9	1.2
Delay (s)	39.2	35.6	31.9	41.5	21.8		58.4	23.6	0.0	46.5	42.8	18.3
Level of Service	D	D	C	D	C		E	C	A	D	D	B
Approach Delay (s)		34.6			32.8			36.2			29.2	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	320	70	430	310	80	620
Future Volume (vph)	320	70	430	310	80	620
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	180	0		0	180	
Storage Lanes	1	1		1	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.850		0.850		
Flt Protected	0.950					0.994
Satd. Flow (prot)	1770	1583	1845	1568	0	3518
Flt Permitted	0.950					0.994
Satd. Flow (perm)	1770	1583	1845	1568	0	3518
Link Speed (mph)	30		30			30
Link Distance (ft)	408		387			233
Travel Time (s)	9.3		8.8			5.3
Peak Hour Factor	0.83	0.83	0.86	0.86	0.81	0.81
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Adj. Flow (vph)	386	84	500	360	99	765
Shared Lane Traffic (%)						
Lane Group Flow (vph)	386	84	500	360	0	864
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 69.8%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	93.6

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	320	70	430	310	80	620
Future Vol, veh/h	320	70	430	310	80	620
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	180	0	-	0	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	83	83	86	86	81	81
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	386	84	500	360	99	765

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1081	500	0	0	500	0
Stage 1	500	-	-	-	-	-
Stage 2	581	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	~ 226	570	-	-	1062	-
Stage 1	608	-	-	-	-	-
Stage 2	523	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 189	570	-	-	1062	-
Mov Cap-2 Maneuver	~ 189	-	-	-	-	-
Stage 1	510	-	-	-	-	-
Stage 2	523	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	$ 434.5	0	1.5
HCM LOS	F		

Minor Lane/Major Mvmt	NET	NER	NWLn1	NWLn2	SWL	SWT
Capacity (veh/h)	-	-	189	570	1062	-
HCM Lane V/C Ratio	-	-	2.04	0.148	0.093	-
HCM Control Delay (s)	-	-	$ 526.8	12.4	8.7	0.6
HCM Lane LOS	-	-	F	B	A	A
HCM 95th %tile Q(veh)	-	-	29.5	0.5	0.3	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	825	0	0	830	40	5	0	5	10	0	40
Future Volume (vph)	30	825	0	0	830	40	5	0	5	10	0	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00			0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00			1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1687	3374			3515			1805	1615		1787	1599
Flt Permitted	0.95	1.00			1.00			0.98	1.00		0.98	1.00
Satd. Flow (perm)	1687	3374			3515			1854	1615		1835	1599
Peak-hour factor, PHF	0.83	0.83	0.83	0.92	0.92	0.92	0.50	0.50	0.50	0.90	0.90	0.90
Adj. Flow (vph)	36	994	0	0	902	43	10	0	10	11	0	44
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	10	0	0	42
Lane Group Flow (vph)	36	994	0	0	943	0	0	10	0	0	11	2
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases					6		8	8	8	4		4
Actuated Green, G (s)	5.2	73.9			62.7			4.1	4.1		4.1	4.1
Effective Green, g (s)	5.2	73.9			62.7			4.1	4.1		4.1	4.1
Actuated g/C Ratio	0.06	0.82			0.70			0.05	0.05		0.05	0.05
Clearance Time (s)	6.0	6.0			6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	97	2770			2448			84	73		83	72
v/s Ratio Prot	0.02	c0.29			c0.27							
v/s Ratio Perm								0.01	0.00		c0.01	0.00
v/c Ratio	0.37	0.36			0.39			0.12	0.01		0.13	0.03
Uniform Delay, d1	40.8	2.0			5.7			41.2	41.0		41.2	41.0
Progression Factor	1.16	0.57			0.80			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.2	0.3			0.1			0.6	0.0		0.7	0.2
Delay (s)	49.5	1.5			4.6			41.9	41.0		42.0	41.2
Level of Service	D	A			A			D	D		D	D
Approach Delay (s)		3.2			4.6			41.4			41.4	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	830	5	5	875	60	10	5	5	60	5	400
Future Volume (vph)	420	830	5	5	875	60	10	5	5	60	5	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99		1.00	0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	3303	3403		1736	3438		1805	1758			1764	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.71	1.00			0.73	1.00
Satd. Flow (perm)	3303	3403		1736	3438		1348	1758			1353	1568
Peak-hour factor, PHF	0.83	0.83	0.83	0.97	0.97	0.97	0.67	0.67	0.67	0.90	0.90	0.90
Adj. Flow (vph)	506	1000	6	5	902	62	15	7	7	67	6	444
RTOR Reduction (vph)	0	0	0	0	6	0	0	6	0	0	0	37
Lane Group Flow (vph)	506	1006	0	5	958	0	15	8	0	0	73	407
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases							8	8		4		
Actuated Green, G (s)	16.7	53.2		1.0	37.5		17.8	17.8			17.8	40.5
Effective Green, g (s)	16.7	53.2		1.0	37.5		17.8	17.8			17.8	40.5
Actuated g/C Ratio	0.19	0.59		0.01	0.42		0.20	0.20			0.20	0.45
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	612	2011		19	1432		266	347			267	705
v/s Ratio Prot	c0.15	0.30		0.00	c0.28			0.00				c0.26
v/s Ratio Perm							0.01				0.05	
v/c Ratio	0.83	0.50		0.26	0.67		0.06	0.02			0.27	0.58
Uniform Delay, d1	35.3	10.7		44.1	21.2		29.3	29.1			30.6	18.4
Progression Factor	1.00	1.00		0.80	0.95		1.00	1.00			1.00	1.00
Incremental Delay, d2	9.0	0.9		7.0	1.2		0.1	0.0			0.6	1.1
Delay (s)	44.2	11.6		42.3	21.4		29.4	29.1			31.2	19.5
Level of Service	D	B		D	C		C	C			C	B
Approach Delay (s)		22.5			21.5			29.3			21.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	110	1320	1220	10	10	80
Future Volume (vph)	110	1320	1220	10	10	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			0	0	175
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.999			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1687	3374	3468	0	1703	1524
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1687	3374	3468	0	1703	1524
Link Speed (mph)		30	30		30	
Link Distance (ft)		535	210		522	
Travel Time (s)		12.2	4.8		11.9	
Peak Hour Factor	0.84	0.84	0.89	0.89	0.83	0.83
Heavy Vehicles (%)	7%	7%	4%	4%	6%	6%
Adj. Flow (vph)	131	1571	1371	11	12	96
Shared Lane Traffic (%)						
Lane Group Flow (vph)	131	1571	1382	0	12	96
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	110	1320	1220	10	10	80
Future Vol, veh/h	110	1320	1220	10	10	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	-	0	175
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	89	89	83	83
Heavy Vehicles, %	7	7	4	4	6	6
Mvmt Flow	131	1571	1371	11	12	96

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1382	0	-	0	2425	691
Stage 1	-	-	-	-	1377	-
Stage 2	-	-	-	-	1048	-
Critical Hdwy	4.24	-	-	-	6.92	7.02
Critical Hdwy Stg 1	-	-	-	-	5.92	-
Critical Hdwy Stg 2	-	-	-	-	5.92	-
Follow-up Hdwy	2.27	-	-	-	3.56	3.36
Pot Cap-1 Maneuver	467	-	-	-	25	378
Stage 1	-	-	-	-	192	-
Stage 2	-	-	-	-	290	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	467	-	-	-	18	378
Mov Cap-2 Maneuver	-	-	-	-	18	-
Stage 1	-	-	-	-	138	-
Stage 2	-	-	-	-	290	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	58.8
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	467	-	-	-	18	378
HCM Lane V/C Ratio	0.28	-	-	-	0.669	0.255
HCM Control Delay (s)	15.7	-	-	-	$ 387.1	17.8
HCM Lane LOS	C	-	-	-	F	C
HCM 95th %tile Q(veh)	1.1	-	-	-	1.8	1

Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	180	340	20	20	125	110	5	10	105	170	40
Future Volume (vph)	10	180	340	20	20	125	110	5	10	105	170	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	150		0		150			0		0
Storage Lanes		1	0		0		0			0		0
Taper Length (ft)		25			25					25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.912				0.940					0.983	
Flt Protected		0.983				0.996					0.983	
Satd. Flow (prot)	0	1654	0	0	0	1727	0	0	0	0	1716	0
Flt Permitted		0.983				0.996					0.983	
Satd. Flow (perm)	0	1654	0	0	0	1727	0	0	0	0	1716	0
Link Speed (mph)		30				30					30	
Link Distance (ft)		465				456					371	
Travel Time (s)		10.6				10.4					8.4	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.86	0.86	0.86	0.86	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	7%	7%	7%	7%
Adj. Flow (vph)	11	198	374	22	23	145	128	6	13	131	213	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	605	0	0	0	302	0	0	0	0	407	0
Sign Control		Yield				Yield					Yield	

Intersection Summary			
Area Type:	Other		
Control Type: Roundabout			
Intersection Capacity Utilization 100.3%		ICU Level of Service G	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	14.1
Intersection LOS	B

Approach	WB	NB	SB	NE	SW
Entry Lanes	1	1	1	1	1
Conflicting Circle Lanes	1	1	1	1	1
Adj Approach Flow, veh/h	605	302	407	475	235
Demand Flow Rate, veh/h	623	311	436	513	252
Vehicles Circulating, veh/h	472	529	478	438	854
Vehicles Exiting, veh/h	368	422	628	476	241
Ped Vol Crossing Leg, #/h	0	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000	1.000
Approach Delay, s/veh	18.8	9.4	11.8	13.2	13.9
Approach LOS	C	A	B	B	B

Lane	Left	Left	Left	Left	Left
Designated Moves	LR	LTR	LTR	LTR	LTR
Assumed Moves	LR	LTR	LTR	LTR	LTR
RT Channelized					
Lane Util	1.000	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
Entry Flow, veh/h	623	311	436	513	252
Cap Entry Lane, veh/h	853	804	847	883	578
Entry HV Adj Factor	0.971	0.970	0.934	0.925	0.932
Flow Entry, veh/h	605	302	407	475	235
Cap Entry, veh/h	828	780	791	817	538
V/C Ratio	0.731	0.387	0.514	0.581	0.436
Control Delay, s/veh	18.8	9.4	11.8	13.2	13.9
LOS	C	A	B	B	B
95th %tile Queue, veh	7	2	3	4	2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	20	220	5	40	50	375	140	5	10	100	20
Future Volume (vph)	5	20	220	5	40	50	375	140	5	10	100	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.929			0.999			0.979	
Flt Protected		0.990			0.997			0.965			0.996	
Satd. Flow (prot)	0	1742	1495	0	1676	0	0	1778	0	0	1781	0
Flt Permitted		0.990			0.997			0.965			0.996	
Satd. Flow (perm)	0	1742	1495	0	1676	0	0	1778	0	0	1781	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		144			453			475			436	
Travel Time (s)		3.3			10.3			10.8			9.9	
Peak Hour Factor	0.82	0.82	0.82	0.70	0.70	0.70	0.75	0.75	0.75	0.71	0.71	0.71
Heavy Vehicles (%)	8%	8%	8%	5%	5%	5%	3%	3%	3%	4%	4%	4%
Adj. Flow (vph)	6	24	268	7	57	71	500	187	7	14	141	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	30	268	0	135	0	0	694	0	0	183	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 51.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	21.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↕			↕			↕	
Traffic Vol, veh/h	5	20	220	5	40	50	375	140	5	10	100	20
Future Vol, veh/h	5	20	220	5	40	50	375	140	5	10	100	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	70	70	70	75	75	75	71	71	71
Heavy Vehicles, %	8	8	8	5	5	5	3	3	3	4	4	4
Mvmt Flow	6	24	268	7	57	71	500	187	7	14	141	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1438	1377	155	1520	1388	191	169	0	0	194	0	0
Stage 1	183	183	-	1191	1191	-	-	-	-	-	-	-
Stage 2	1255	1194	-	329	197	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.15	6.55	6.25	4.13	-	-	4.14	-	-
Critical Hdwy Stg 1	6.18	5.58	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.545	4.045	3.345	2.227	-	-	2.236	-	-
Pot Cap-1 Maneuver	108	141	875	96	141	843	1402	-	-	1367	-	-
Stage 1	805	737	-	225	257	-	-	-	-	-	-	-
Stage 2	204	253	-	678	732	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	32	84	875	36	84	843	1402	-	-	1367	-	-
Mov Cap-2 Maneuver	32	84	-	36	84	-	-	-	-	-	-	-
Stage 1	483	729	-	135	154	-	-	-	-	-	-	-
Stage 2	70	152	-	449	724	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.7	127.6	6.5	0.6
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1402	-	-	63	875	141	1367	-	-
HCM Lane V/C Ratio	0.357	-	-	0.484	0.307	0.963	0.01	-	-
HCM Control Delay (s)	9	0	-	107	10.9	127.6	7.7	0	-
HCM Lane LOS	A	A	-	F	B	F	A	A	-
HCM 95th %tile Q(veh)	1.6	-	-	1.9	1.3	6.8	0	-	-

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	50	20	10	40	90	20	230	90	70	280	40
Future Volume (vph)	30	50	20	10	40	90	20	230	90	70	280	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1767		1736	1827	1553	1770	1784		1787	1846	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1767		1736	1827	1553	1770	1784		1787	1846	
Peak-hour factor, PHF	0.82	0.82	0.82	0.81	0.81	0.81	0.68	0.68	0.68	0.78	0.78	0.78
Adj. Flow (vph)	37	61	24	12	49	111	29	338	132	90	359	51
RTOR Reduction (vph)	0	16	0	0	0	83	0	19	0	0	7	0
Lane Group Flow (vph)	37	69	0	12	49	28	29	451	0	90	403	0
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	3	3	8		7	4	
Permitted Phases						2						
Actuated Green, G (s)	2.4	11.3		1.2	10.1	16.0	5.9	20.9		5.9	20.9	
Effective Green, g (s)	2.4	11.3		1.2	10.1	16.0	5.9	20.9		5.9	20.9	
Actuated g/C Ratio	0.04	0.18		0.02	0.16	0.25	0.09	0.33		0.09	0.33	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	66	315		32	291	539	164	589		166	609	
v/s Ratio Prot	c0.02	c0.04		0.01	0.03	0.00	0.02	c0.25		c0.05	0.22	
v/s Ratio Perm						0.01						
v/c Ratio	0.56	0.22		0.38	0.17	0.05	0.18	0.76		0.54	0.66	
Uniform Delay, d1	29.9	22.2		30.7	23.0	17.9	26.5	19.0		27.4	18.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.4	0.3		7.2	1.2	0.0	0.5	5.9		3.6	2.7	
Delay (s)	40.4	22.6		37.9	24.2	17.9	27.0	24.9		31.0	20.9	
Level of Service	D	C		D	C	B	C	C		C	C	
Approach Delay (s)		28.0			21.1			25.0			22.7	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	63.3	Sum of lost time (s)	24.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	450	0	20	60	170	580
Future Volume (vph)	450	0	20	60	170	580
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	4.0	4.0	6.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	0.95		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770		1626	1712	1863	1583
Flt Permitted	0.95		0.58	1.00	1.00	1.00
Satd. Flow (perm)	1770		993	1712	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.91	0.91	0.82	0.82
Adj. Flow (vph)	479	0	22	66	207	707
RTOR Reduction (vph)	0	0	0	0	0	169
Lane Group Flow (vph)	479	0	22	66	207	538
Heavy Vehicles (%)	2%	2%	11%	11%	2%	2%
Turn Type	Prot		pm+pt	NA	NA	custom
Protected Phases	8		1	6 7	2 7	7 8
Permitted Phases			6 7			2
Actuated Green, G (s)	22.0		34.6	33.0	32.2	56.2
Effective Green, g (s)	22.0		30.6	33.0	32.2	56.2
Actuated g/C Ratio	0.30		0.41	0.45	0.44	0.76
Clearance Time (s)	6.0		6.0			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap (vph)	527		425	765	812	1205
v/s Ratio Prot	c0.27		c0.00	0.04	0.11	c0.24
v/s Ratio Perm			0.02			0.10
v/c Ratio	0.91		0.05	0.09	0.25	0.45
Uniform Delay, d1	24.9		12.9	11.7	13.2	3.2
Progression Factor	1.00		1.00	1.00	1.05	1.72
Incremental Delay, d2	19.4		0.1	0.0	0.2	0.2
Delay (s)	44.4		12.9	11.8	14.0	5.7
Level of Service	D		B	B	B	A
Approach Delay (s)	44.4			12.1	7.6	
Approach LOS	D			B	A	

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	73.8	Sum of lost time (s)	22.0
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations			↰↰		↰↰	
Traffic Volume (vph)	0	0	1575	0	460	0
Future Volume (vph)	0	0	1575	0	460	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0		6.0	
Lane Util. Factor			0.97		0.97	
Frt			1.00		1.00	
Flt Protected			0.95		0.95	
Satd. Flow (prot)			3433		3433	
Flt Permitted			0.95		0.95	
Satd. Flow (perm)			3433		3433	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	1676	0	489	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	1676	0	489	0
Turn Type			Prot		Prot	
Protected Phases			4		2	
Permitted Phases						
Actuated Green, G (s)			57.0		21.0	
Effective Green, g (s)			57.0		21.0	
Actuated g/C Ratio			0.63		0.23	
Clearance Time (s)			6.0		6.0	
Vehicle Extension (s)			3.0		3.0	
Lane Grp Cap (vph)			2174		801	
v/s Ratio Prot			c0.49		c0.14	
v/s Ratio Perm						
v/c Ratio			0.77		0.61	
Uniform Delay, d1			11.8		30.8	
Progression Factor			1.00		1.16	
Incremental Delay, d2			2.7		3.4	
Delay (s)			14.5		39.3	
Level of Service			B		D	
Approach Delay (s)	0.0			14.5	39.3	
Approach LOS	A			B	D	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	122.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBR	NWL	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations										
Traffic Volume (vph)	0	0	0	255	0	1575	0	0	460	1225
Future Volume (vph)	0	0	0	255	0	1575	0	0	460	1225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0	6.0		6.0			6.0	6.0
Lane Util. Factor			1.00	0.95		0.95			0.95	0.88
Frt			0.85	0.85		1.00			1.00	0.85
Flt Protected			1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)			1583	1504		3539			3539	2787
Flt Permitted			1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)			1583	1504		3539			3539	2787
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	271	0	1676	0	0	489	1303
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	102
Lane Group Flow (vph)	0	0	136	135	0	1676	0	0	489	1201
Turn Type			Prot	Prot	Perm	NA			NA	Perm
Protected Phases			4	4		2			2	
Permitted Phases					2					2
Actuated Green, G (s)			13.7	13.7		64.3			64.3	64.3
Effective Green, g (s)			13.7	13.7		64.3			64.3	64.3
Actuated g/C Ratio			0.15	0.15		0.71			0.71	0.71
Clearance Time (s)			6.0	6.0		6.0			6.0	6.0
Vehicle Extension (s)			3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)			240	228		2528			2528	1991
v/s Ratio Prot			0.09	c0.09		c0.47			0.14	
v/s Ratio Perm										0.43
v/c Ratio			0.57	0.59		0.66			0.19	0.60
Uniform Delay, d1			35.4	35.5		7.0			4.3	6.4
Progression Factor			1.00	1.00		0.43			1.00	1.00
Incremental Delay, d2			3.1	4.1		0.9			0.2	1.4
Delay (s)			38.4	39.6		3.9			4.4	7.8
Level of Service			D	D		A			A	A
Approach Delay (s)	0.0		39.0			3.9			6.9	
Approach LOS	A		D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	350	5	10	380	10	5	50	10	10	50	50
Future Volume (vph)	50	350	5	10	380	10	5	50	10	10	50	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1859		1770	1855		1770	1815		1770	1863	1583
Flt Permitted	0.30	1.00		0.48	1.00		0.72	1.00		0.71	1.00	1.00
Satd. Flow (perm)	553	1859		887	1855		1345	1815		1331	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	380	5	11	413	11	5	54	11	11	54	54
RTOR Reduction (vph)	0	1	0	0	1	0	0	7	0	0	0	33
Lane Group Flow (vph)	54	384	0	11	423	0	5	58	0	11	54	21
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	28.8	25.0		23.0	22.1		22.6	22.6		22.6	22.6	26.4
Effective Green, g (s)	28.8	25.0		23.0	22.1		22.6	22.6		22.6	22.6	26.4
Actuated g/C Ratio	0.43	0.38		0.35	0.33		0.34	0.34		0.34	0.34	0.40
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	309	698		318	616		457	616		452	633	771
v/s Ratio Prot	c0.01	c0.21		0.00	c0.23			c0.03			0.03	0.00
v/s Ratio Perm	0.07			0.01			0.00			0.01		0.01
v/c Ratio	0.17	0.55		0.03	0.69		0.01	0.09		0.02	0.09	0.03
Uniform Delay, d1	11.9	16.3		14.4	19.2		14.5	15.0		14.6	14.9	12.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	0.9		0.0	3.2		0.0	0.3		0.1	0.3	0.0
Delay (s)	12.2	17.3		14.4	22.4		14.6	15.3		14.7	15.2	12.2
Level of Service	B	B		B	C		B	B		B	B	B
Approach Delay (s)		16.6			22.2			15.2			13.8	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	255	0	215	385	0	195
Future Volume (vph)	255	0	215	385	0	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	80
Storage Lanes		0	0		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850
Flt Protected				0.982		
Satd. Flow (prot)	1863	0	0	1829	1863	1583
Flt Permitted				0.982		
Satd. Flow (perm)	1863	0	0	1829	1863	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	354			472	168	
Travel Time (s)	8.0			10.7	3.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	277	0	234	418	0	212
Shared Lane Traffic (%)						
Lane Group Flow (vph)	277	0	0	652	0	212
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		

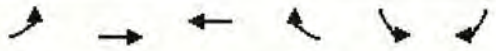
Intersection	
Int Delay, s/veh	3.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	255	0	215	385	0	195
Future Vol, veh/h	255	0	215	385	0	195
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	80
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	277	0	234	418	0	212

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	277	0	1163	277
Stage 1	-	-	-	-	277	-
Stage 2	-	-	-	-	886	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1286	-	215	762
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	403	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1286	-	164	762
Mov Cap-2 Maneuver	-	-	-	-	164	-
Stage 1	-	-	-	-	588	-
Stage 2	-	-	-	-	403	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3	11.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	762	-	-	1286	-
HCM Lane V/C Ratio	-	0.278	-	-	0.182	-
HCM Control Delay (s)	0	11.5	-	-	8.4	0
HCM Lane LOS	A	B	-	-	A	A
HCM 95th %tile Q(veh)	-	1.1	-	-	0.7	-



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	55	1775	1590	220	90	95
Future Volume (vph)	55	1775	1590	220	90	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.08	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	144	3539	3539	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	1929	1728	239	98	103
RTOR Reduction (vph)	0	0	0	69	0	20
Lane Group Flow (vph)	60	1929	1728	170	98	83
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	4	4	5
Permitted Phases	2			6		4
Actuated Green, G (s)	55.5	55.5	45.8	53.4	7.6	11.3
Effective Green, g (s)	55.5	55.5	45.8	53.4	7.6	11.3
Actuated g/C Ratio	0.74	0.74	0.61	0.71	0.10	0.15
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	186	2615	2158	1252	179	364
v/s Ratio Prot	0.02	c0.55	c0.49	0.01	c0.06	0.01
v/s Ratio Perm	0.22			0.09		0.04
v/c Ratio	0.32	0.74	0.80	0.14	0.55	0.23
Uniform Delay, d1	9.9	5.6	11.2	3.5	32.1	28.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	1.1	2.2	0.0	3.4	0.3
Delay (s)	10.9	6.7	13.4	3.5	35.5	28.4
Level of Service	B	A	B	A	D	C
Approach Delay (s)		6.9	12.2		31.9	
Approach LOS		A	B		C	

Intersection Summary			
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	75.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	70	10	460	50	10	680
Future Volume (vph)	70	10	460	50	10	680
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0	4.0	6.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1769		1900	1615	1805	1900
Flt Permitted	0.96		1.00	1.00	0.26	1.00
Satd. Flow (perm)	1769		1900	1615	488	1900
Peak-hour factor, PHF	0.87	0.67	0.95	0.84	0.73	0.96
Adj. Flow (vph)	80	15	484	60	14	708
RTOR Reduction (vph)	8	0	0	25	0	0
Lane Group Flow (vph)	87	0	484	35	14	708
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Turn Type	Prot		NA	Perm	custom	NA
Protected Phases	7		6 8		5	2 8
Permitted Phases				6 8	2	
Actuated Green, G (s)	11.6		39.4	39.4	17.4	38.6
Effective Green, g (s)	11.6		39.4	39.4	17.4	38.6
Actuated g/C Ratio	0.16		0.53	0.53	0.24	0.52
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	278		1014	862	129	993
v/s Ratio Prot	c0.05		0.25		c0.00	c0.37
v/s Ratio Perm				0.02	0.02	
v/c Ratio	0.31		0.48	0.04	0.11	0.71
Uniform Delay, d1	27.6		10.8	8.2	22.1	13.4
Progression Factor	1.00		0.53	0.42	1.00	1.00
Incremental Delay, d2	0.7		0.2	0.0	0.4	2.4
Delay (s)	28.2		5.9	3.4	22.5	15.8
Level of Service	C		A	A	C	B
Approach Delay (s)	28.2		5.6			16.0
Approach LOS	C		A			B

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	73.8	Sum of lost time (s)	22.0
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	30	20	450	660	20
Future Volume (vph)	5	30	20	450	660	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.888				0.995	
Flt Protected	0.992		0.950			
Satd. Flow (prot)	1674	0	1787	1900	1873	0
Flt Permitted	0.992		0.950			
Satd. Flow (perm)	1674	0	1787	1900	1873	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	332			288	365	
Travel Time (s)	7.5			6.5	8.3	
Peak Hour Factor	0.64	0.77	0.71	0.90	0.75	0.55
Heavy Vehicles (%)	0%	0%	1%	0%	1%	0%
Adj. Flow (vph)	8	39	28	500	880	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	0	28	500	916	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.9%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	30	20	450	660	20
Future Vol, veh/h	5	30	20	450	660	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	64	77	71	90	75	55
Heavy Vehicles, %	0	0	1	0	1	0
Mvmt Flow	8	39	28	500	880	36

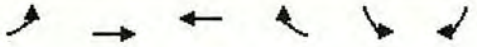
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1454	898	916	0	-	0
Stage 1	898	-	-	-	-	-
Stage 2	556	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	145	341	749	-	-	-
Stage 1	401	-	-	-	-	-
Stage 2	578	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	140	341	749	-	-	-
Mov Cap-2 Maneuver	140	-	-	-	-	-
Stage 1	386	-	-	-	-	-
Stage 2	578	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.8	0.5	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	749	-	275	-	-
HCM Lane V/C Ratio	0.038	-	0.17	-	-
HCM Control Delay (s)	10	-	20.8	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

APPENDIX Q-3: ALTERNATIVE C INTERSECTION CAPACITY ANALYSES – SYNCHRO PRINTSOUTS – AM PEAK HOUR

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1345	715	0	115	1010
Future Volume (vph)	0	1345	715	0	115	1010
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.88
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3471	3406	0	1930	2682
Flt Permitted					0.950	
Satd. Flow (perm)	0	3471	3406	0	1930	2682
Right Turn on Red				Yes		No
Satd. Flow (RTOR)						
Link Speed (mph)		30	30		25	
Link Distance (ft)		712	388		212	
Travel Time (s)		16.2	8.8		5.8	
Peak Hour Factor	0.93	0.93	0.88	0.88	0.89	0.89
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Adj. Flow (vph)	0	1446	813	0	129	1135
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1446	813	0	129	1135
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		24	24		16	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	0.85	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors		3	3		3	3
Detector Template		Thru	Thru		Left	
Leading Detector (ft)		256	256		256	256
Trailing Detector (ft)		-5	-5		-5	-5
Detector 1 Position(ft)		-5	-5		-5	-5
Detector 1 Size(ft)		50	50		50	50
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		125	125		125	125
Detector 2 Size(ft)		6	6		6	6
Detector 2 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0		0.0	0.0
Detector 3 Position(ft)		250	250		250	250
Detector 3 Size(ft)		6	6		6	6
Detector 3 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 3 Channel						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 3 Extend (s)		0.0	0.0		0.0	0.0
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0		5.0	5.0
Minimum Split (s)		14.0	21.0		27.0	27.0
Total Split (s)		38.0	38.0		37.0	37.0
Total Split (%)		50.7%	50.7%		49.3%	49.3%
Maximum Green (s)		32.0	32.0		31.0	31.0
Yellow Time (s)		2.0	2.0		2.0	2.0
All-Red Time (s)		4.0	4.0		4.0	4.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		14.0	14.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		32.0	32.0		31.0	31.0
Actuated g/C Ratio		0.43	0.43		0.41	0.41
v/c Ratio		0.98	0.56		0.16	1.02
Control Delay		33.0	20.1		14.6	57.4
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		33.0	20.1		14.6	57.4
LOS		C	C		B	E
Approach Delay		33.0	20.1		53.1	
Approach LOS		C	C		D	
Queue Length 50th (ft)		334	385		37	~307
Queue Length 95th (ft)		m#453	m376		69	#447
Internal Link Dist (ft)		632	308		132	
Turn Bay Length (ft)						
Base Capacity (vph)		1480	1453		797	1108
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.98	0.56		0.16	1.02

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02

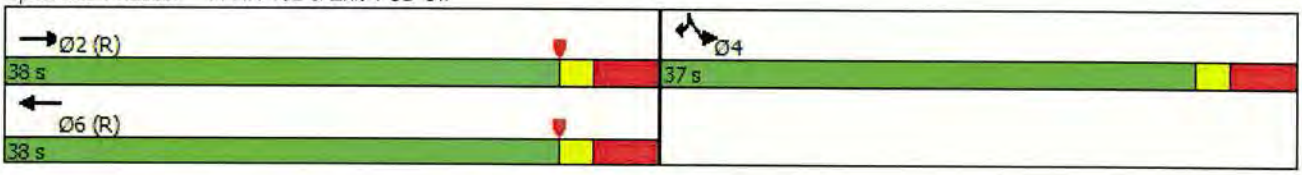
Intersection Signal Delay: 37.2 Intersection LOS: D
Intersection Capacity Utilization 67.1% ICU Level of Service C
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: NH 102 & Exit 4 SB Off



Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	455	0	300	0	0	1350	110	0	0	990	375
Future Volume (vph)	455	0	300	0	0	1350	110	0	0	990	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0	0	0	550		0	0		0
Storage Lanes		2	2	0	0	2		0	0		1
Taper Length (ft)		25		25		25			25		
Lane Util. Factor	0.97	1.00	0.88	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt			0.850								0.850
Flt Protected	0.950					0.950					
Satd. Flow (prot)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Flt Permitted	0.950					0.950					
Satd. Flow (perm)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Right Turn on Red			No					Yes			Yes
Satd. Flow (RTOR)											190
Link Speed (mph)		25		30			30			30	
Link Distance (ft)		856		390			760			857	
Travel Time (s)		23.3		8.9			17.3			19.5	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Adj. Flow (vph)	517	0	341	0	0	1436	117	0	0	1076	408
Shared Lane Traffic (%)											
Lane Group Flow (vph)	517	0	341	0	0	1436	117	0	0	1076	408
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		24		0			24			24	
Link Offset(ft)		12		0			0			0	
Crosswalk Width(ft)		16		16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	25	15	9	15		9	15		25
Number of Detectors	3		3			3	3			3	0
Detector Template											
Leading Detector (ft)	256		256			256	256			256	0
Trailing Detector (ft)	-5		-5			-5	-5			-5	0
Detector 1 Position(ft)	-5		-5			-5	-5			-5	-5
Detector 1 Size(ft)	55		55			55	55			55	50
Detector 1 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Queue (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Delay (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 2 Position(ft)	125		125			125	125			125	
Detector 2 Size(ft)	6		6			6	6			6	
Detector 2 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	
Detector 2 Channel											
Detector 2 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Detector 3 Position(ft)	250		250			250	250			250	
Detector 3 Size(ft)	6		6			6	6			6	

Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	
Detector 3 Channel											
Detector 3 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Detector Phase	8		2			5	2			6	
Switch Phase											
Minimum Initial (s)	10.0		10.0			5.0	8.0			8.0	
Minimum Split (s)	16.0		16.0			11.0	42.0			31.0	
Total Split (s)	29.0		29.0			69.0	121.0			52.0	
Total Split (%)	19.3%		19.3%			46.0%	80.7%			34.7%	
Maximum Green (s)	23.0		23.0			63.0	115.0			46.0	
Yellow Time (s)	2.0		2.0			2.0	2.0			2.0	
All-Red Time (s)	4.0		4.0			4.0	4.0			4.0	
Lost Time Adjust (s)	0.0		0.0			0.0	0.0			0.0	
Total Lost Time (s)	6.0		6.0			6.0	6.0			6.0	
Lead/Lag						Lead				Lag	
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Recall Mode	None		None			None	C-Min			C-Min	
Walk Time (s)							7.0			7.0	
Flash Dont Walk (s)							29.0			17.0	
Pedestrian Calls (#/hr)							0			0	
Act Effct Green (s)	23.0		23.0			63.0	115.0			46.0	150.0
Actuated g/C Ratio	0.15		0.15			0.42	0.77			0.31	1.00
v/c Ratio	1.04		0.85			1.03	0.04			1.00	0.26
Control Delay	111.4		81.0			49.1	8.1			79.3	0.4
Queue Delay	0.0		0.0			0.0	0.0			0.0	0.0
Total Delay	111.4		81.0			49.1	8.1			79.3	0.4
LOS	F		F			D	A			E	A
Approach Delay		99.3					46.0			57.6	
Approach LOS		F					D			E	
Queue Length 50th (ft)	~280		186			~434	21			~557	0
Queue Length 95th (ft)	#384		#264			m#791	m23			#713	0
Internal Link Dist (ft)		776		310			680			777	
Turn Bay Length (ft)						550					
Base Capacity (vph)	497		403			1400	2635			1074	1568
Starvation Cap Reductn	0		0			0	0			0	0
Spillback Cap Reductn	0		0			0	0			0	0
Storage Cap Reductn	0		0			0	0			0	0
Reduced v/c Ratio	1.04		0.85			1.03	0.04			1.00	0.26

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 3 (2%), Referenced to phase 2:NET and 6:SWT, Start of Yellow
Natural Cycle: 140

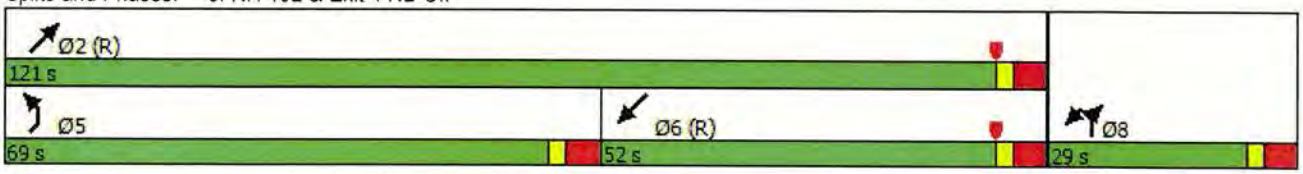
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 62.1 Intersection LOS: E
Intersection Capacity Utilization 94.9% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: NH 102 & Exit 4 NB Off



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	575	470	280	730	0	0	0	0	105	0	360
Future Volume (vph)	0	575	470	280	730	0	0	0	0	105	0	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		350	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3167	1417	1687	3374	0	0	0	0	3303	0	1524
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	3167	1417	1687	3374	0	0	0	0	3303	0	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			511									112
Link Speed (mph)		30			30			30			35	
Link Distance (ft)		851			693			486			581	
Travel Time (s)		19.3			15.8			11.0			11.3	
Peak Hour Factor	0.92	0.92	0.92	0.73	0.73	0.73	0.92	0.92	0.92	0.74	0.74	0.74
Heavy Vehicles (%)	14%	14%	14%	7%	7%	7%	2%	2%	2%	6%	6%	6%
Adj. Flow (vph)	0	625	511	384	1000	0	0	0	0	142	0	486
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	625	511	384	1000	0	0	0	0	142	0	486
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Right
Median Width(ft)		36			36			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		25	15		9	15		9	15		9
Number of Detectors		3	2	3	3					3		2
Detector Template		Thru	Right	Left	Thru					Left		
Leading Detector (ft)		256	131	256	256					256		206
Trailing Detector (ft)		-5	-5	-5	-5					-5		-5
Detector 1 Position(ft)		-5	-5	-5	-5					-5		-5
Detector 1 Size(ft)		50	50	50	50					50		50
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 2 Position(ft)		125	125	125	125					125		200
Detector 2 Size(ft)		6	6	6	6					6		6
Detector 2 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 3 Position(ft)		250		250	250					250		
Detector 3 Size(ft)		6		6	6					6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 3 Type		Cl+Ex		Cl+Ex	Cl+Ex					Cl+Ex		
Detector 3 Channel												
Detector 3 Extend (s)		0.0		0.0	0.0					0.0		
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Detector Phase		2		1	6					4		4
Switch Phase												
Minimum Initial (s)		9.0		4.0	9.0					4.0		4.0
Minimum Split (s)		21.0		10.0	21.0					10.0		10.0
Total Split (s)		34.0		36.0	70.0					40.0		40.0
Total Split (%)		30.9%		32.7%	63.6%					36.4%		36.4%
Maximum Green (s)		28.0		30.0	64.0					34.0		34.0
Yellow Time (s)		4.0		4.0	4.0					4.0		4.0
All-Red Time (s)		2.0		2.0	2.0					2.0		2.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0					6.0		6.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Recall Mode		C-Min		None	C-Min					None		None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		8.0			8.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)		31.7	110.0	28.1	65.7					32.3		32.3
Actuated g/C Ratio		0.29	1.00	0.26	0.60					0.29		0.29
v/c Ratio		0.69	0.36	0.89	0.50					0.15		0.92
Control Delay		40.6	0.7	35.2	1.8					28.5		53.7
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		40.6	0.7	35.2	1.8					28.5		53.7
LOS		D	A	D	A					C		D
Approach Delay		22.7			11.0						48.0	
Approach LOS		C			B						D	
Queue Length 50th (ft)		216	0	47	16					37		260
Queue Length 95th (ft)		284	0	m40	13					50		287
Internal Link Dist (ft)		771			613			406			501	
Turn Bay Length (ft)			350									
Base Capacity (vph)		912	1417	460	2016					1020		548
Starvation Cap Reductn		0	0	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.69	0.36	0.83	0.50					0.14		0.89

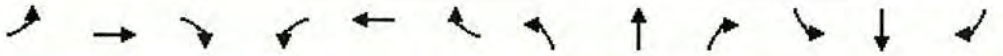
Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 58 (53%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 70

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 22.6 Intersection LOS: C
Intersection Capacity Utilization 71.3% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Exit 5 SB On/Exit 5 SB Off & NH 28

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	480	200	0	0	595	340	415	0	160	0	0	0
Future Volume (vph)	480	200	0	0	595	340	415	0	160	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1641	3282	0	0	3438	1538	1656	0	1482	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1641	3282	0	0	3438	1538	1656	0	1482	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						378			201			
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		693			542			867			392	
Travel Time (s)		15.8			12.3			16.9			8.9	
Peak Hour Factor	0.87	0.87	0.87	0.90	0.90	0.90	0.78	0.78	0.78	0.92	0.92	0.92
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	9%	9%	9%	2%	2%	2%
Adj. Flow (vph)	552	230	0	0	661	378	532	0	205	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	552	230	0	0	661	378	532	0	205	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Right	Right	Left	Right	Left	Left	Right
Median Width(ft)		36			42			12			12	
Link Offset(ft)		0			0			0			36	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		25	15		9	15		9
Number of Detectors	3	3			3	2	3		0			
Detector Template	Left	Thru			Thru	Right	Left					
Leading Detector (ft)	256	256			256	131	256		0			
Trailing Detector (ft)	-5	-5			-5	-5	-5		0			
Detector 1 Position(ft)	-5	-5			-5	-5	-5		-5			
Detector 1 Size(ft)	50	50			50	50	50		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 2 Position(ft)	125	125			125	125	125					
Detector 2 Size(ft)	6	6			6	6	6					
Detector 2 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex					
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0			0.0	0.0	0.0					
Detector 3 Position(ft)	250	250			250		250					
Detector 3 Size(ft)	6	6			6		6					
Detector 3 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex					
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0			0.0		0.0					

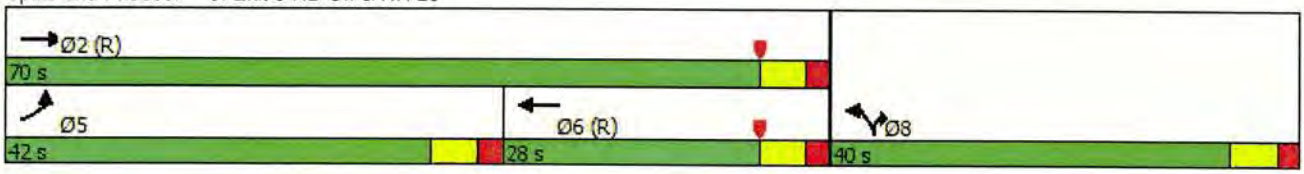


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Detector Phase	5	2			6		8		8			
Switch Phase												
Minimum Initial (s)	4.0	16.0			16.0		4.0		4.0			
Minimum Split (s)	10.0	23.0			23.0		10.0		10.0			
Total Split (s)	42.0	70.0			28.0		40.0		40.0			
Total Split (%)	38.2%	63.6%			25.5%		36.4%		36.4%			
Maximum Green (s)	36.0	64.0			22.0		34.0		34.0			
Yellow Time (s)	4.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	2.0	2.0			2.0		2.0		2.0			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.0		6.0		6.0			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		10.0			10.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	36.0	64.0			22.0	110.0	34.0		34.0			
Actuated g/C Ratio	0.33	0.58			0.20	1.00	0.31		0.31			
v/c Ratio	1.03	0.12			0.96	0.25	1.04		0.34			
Control Delay	54.7	1.6			70.4	0.4	88.9		6.0			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	54.7	1.6			70.4	0.4	88.9		6.0			
LOS	D	A			E	A	F		A			
Approach Delay		39.1			44.9			65.9				
Approach LOS		D			D			E				
Queue Length 50th (ft)	~412	2			245	0	~407		2			
Queue Length 95th (ft)	#569	3			#363	0	#483		33			
Internal Link Dist (ft)		613			462			787			312	
Turn Bay Length (ft)												
Base Capacity (vph)	537	1909			687	1538	511		596			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.03	0.12			0.96	0.25	1.04		0.34			

Intersection Summary	
Area Type:	Other
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 49.2	Intersection LOS: D

Intersection Capacity Utilization 71.3% ICU Level of Service C
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Exit 5 NB Off & NH 28



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	0	170	0	0	0	100	450	5	5	1010	40
Future Volume (vph)	10	0	170	0	0	0	100	450	5	5	1010	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		225	0		0	350		0	100		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850					0.998			0.994	
Flt Protected		0.950					0.950			0.950		
Satd. Flow (prot)	0	1770	1583	0	1900	0	1770	3532	0	1770	3518	0
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	1863	1583	0	1900	0	1770	3532	0	1770	3518	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			185					2			5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		593			447			750			330	
Travel Time (s)		13.5			10.2			17.0			7.5	
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	11	0	185	0	0	0	109	489	5	5	1098	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	11	185	0	0	0	109	494	0	5	1141	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	3	1	3	1		3	3		3	3	
Detector Template	Left	Thru	Right	Left			Left	Thru		Left	Thru	
Leading Detector (ft)	256	256	45	256	45		256	256		256	256	
Trailing Detector (ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Position(ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	125	125		125			125	125		125	125	
Detector 2 Size(ft)	6	6		6			6	6		6	6	
Detector 2 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Detector 3 Position(ft)	250	250		250			250	250		250	250	
Detector 3 Size(ft)	6	6		6			6	6		6	6	

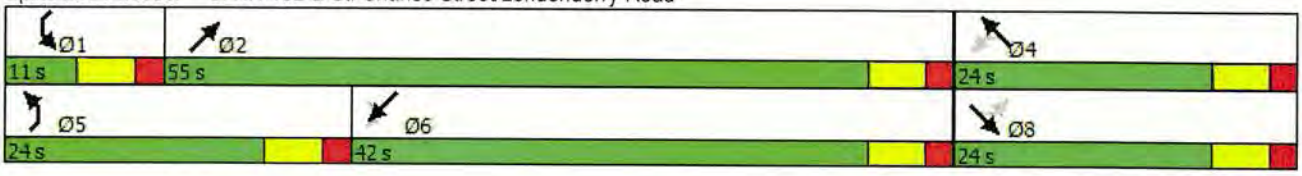
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	custom				Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Detector Phase	8	8	6	4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	8.0	5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		24.0	24.0		11.0	24.0	
Total Split (s)	24.0	24.0	42.0	24.0	24.0		24.0	55.0		11.0	42.0	
Total Split (%)	26.7%	26.7%	46.7%	26.7%	26.7%		26.7%	61.1%		12.2%	46.7%	
Maximum Green (s)	18.0	18.0	36.0	18.0	18.0		18.0	49.0		5.0	36.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lead/Lag			Lag				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	Min	None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0			0	
Act Effct Green (s)		6.3	41.9				9.4	55.9		5.2	41.9	
Actuated g/C Ratio		0.10	0.69				0.15	0.92		0.09	0.69	
v/c Ratio		0.06	0.16				0.40	0.15		0.03	0.47	
Control Delay		27.8	2.1				29.5	2.3		29.6	8.4	
Queue Delay		0.0	0.0				0.0	0.0		0.0	0.0	
Total Delay		27.8	2.1				29.5	2.3		29.6	8.4	
LOS		C	A				C	A		C	A	
Approach Delay		3.5						7.2			8.5	
Approach LOS		A						A			A	
Queue Length 50th (ft)		3	0				34	0		2	91	
Queue Length 95th (ft)		19	30				89	74		13	270	
Internal Link Dist (ft)		513			367			670			250	
Turn Bay Length (ft)			225				350			100		
Base Capacity (vph)		568	1147				540	3288		150	2424	
Starvation Cap Reductn		0	0				0	0		0	0	
Spillback Cap Reductn		0	0				0	0		0	0	
Storage Cap Reductn		0	0				0	0		0	0	
Reduced v/c Ratio		0.02	0.16				0.20	0.15		0.03	0.47	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 60.9
Natural Cycle: 80
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.47
Intersection Signal Delay: 7.6 Intersection LOS: A
Intersection Capacity Utilization 57.7% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 9: NH 102 & St. Charles Street/Londonderry Road



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	10	10	360	0	40	0	380	110	15	525	0
Future Volume (vph)	10	10	10	360	0	40	0	380	110	15	525	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.955			0.986			0.970				
Flt Protected		0.984			0.957						0.999	
Satd. Flow (prot)	0	1750	0	0	1741	0	0	1706	0	0	1808	0
Flt Permitted		0.844			0.711						0.980	
Satd. Flow (perm)	0	1501	0	0	1293	0	0	1706	0	0	1773	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			36			22				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		356			493			1124			603	
Travel Time (s)		8.1			11.2			25.5			13.7	
Peak Hour Factor	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Adj. Flow (vph)	17	17	17	375	0	42	0	427	124	17	610	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	51	0	0	417	0	0	551	0	0	627	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		-22			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	1		3	2			2		3	2	
Detector Template	Left			Left						Left		
Leading Detector (ft)	256	45		256	131			131		256	131	
Trailing Detector (ft)	-5	-5		-5	-5			-5		-5	-5	
Detector 1 Position(ft)	-5	-5		-5	-5			-5		-5	-5	
Detector 1 Size(ft)	50	50		50	50			50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 2 Position(ft)	125			125	125			125		125	125	
Detector 2 Size(ft)	6			6	6			6		6	6	
Detector 2 Type	Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0	0.0			0.0		0.0	0.0	
Detector 3 Position(ft)	250			250						250		
Detector 3 Size(ft)	6			6						6		
Detector 3 Type	Cl+Ex			Cl+Ex						Cl+Ex		
Detector 3 Channel												
Detector 3 Extend (s)	0.0			0.0						0.0		

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Detector Phase	4	4		4	4			2		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0			24.0		24.0	24.0	
Total Split (s)	42.0	42.0		42.0	42.0			48.0		48.0	48.0	
Total Split (%)	46.7%	46.7%		46.7%	46.7%			53.3%		53.3%	53.3%	
Maximum Green (s)	36.0	36.0		36.0	36.0			42.0		42.0	42.0	
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Recall Mode	None	None		None	None			Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		27.9			27.9			34.8			34.8	
Actuated g/C Ratio		0.37			0.37			0.46			0.46	
v/c Ratio		0.09			0.83			0.69			0.77	
Control Delay		12.8			37.0			21.7			25.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		12.8			37.0			21.7			25.4	
LOS		B			D			C			C	
Approach Delay		12.8			37.0			21.7			25.4	
Approach LOS		B			D			C			C	
Queue Length 50th (ft)		11			182			207			258	
Queue Length 95th (ft)		20			#342			341			392	
Internal Link Dist (ft)		276			413			1044			523	
Turn Bay Length (ft)												
Base Capacity (vph)		771			675			1021			1052	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.07			0.62			0.54			0.60	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 75.5			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 26.7		Intersection LOS: C	
Intersection Capacity Utilization 80.1%		ICU Level of Service D	

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: NH 102 & Fordway/Madden Hill Road

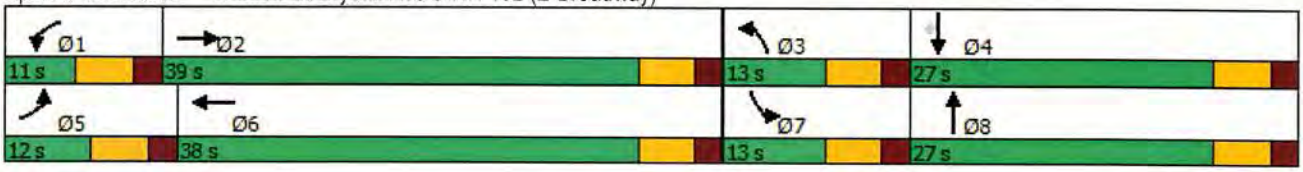
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	210	50	20	400	50	70	270	20	70	270	40
Future Volume (vph)	60	210	50	20	400	50	70	270	20	70	270	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	390		0	110		0	70		0	245		245
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971			0.983			0.989				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1693	0	1703	1762	0	1719	1790	0	1703	1792	1524
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1656	1693	0	1703	1762	0	1719	1790	0	1703	1792	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			8			4				182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		505			530			361			411	
Travel Time (s)		11.5			12.0			8.2			9.3	
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.91	0.91	0.91
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	5%	5%	5%	6%	6%	6%
Parking (#/hr)			0									
Adj. Flow (vph)	63	219	52	21	426	53	82	318	24	77	297	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	63	271	0	21	479	0	82	342	0	77	297	44
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Detector Phase	5	2		1	6		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	10.0		4.0	10.0		4.0	9.0	9.0
Minimum Split (s)	10.0	30.0		10.0	30.0		10.0	25.0		10.0	25.0	25.0
Total Split (s)	12.0	39.0		11.0	38.0		13.0	27.0		13.0	27.0	27.0
Total Split (%)	13.3%	43.3%		12.2%	42.2%		14.4%	30.0%		14.4%	30.0%	30.0%
Maximum Green (s)	6.0	33.0		5.0	32.0		7.0	21.0		7.0	21.0	21.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Min		None	Min		Min	None		Min	None	None
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)		10			10			0			10	10
Act Effct Green (s)	6.2	30.7		5.3	25.7		7.0	18.5		7.0	18.5	18.5
Actuated g/C Ratio	0.08	0.39		0.07	0.33		0.09	0.23		0.09	0.23	0.23
v/c Ratio	0.48	0.41		0.19	0.83		0.54	0.81		0.51	0.71	0.09
Control Delay	53.8	19.7		44.2	38.6		53.6	46.9		52.3	40.4	0.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	53.8	19.7		44.2	38.6		53.6	46.9		52.3	40.4	0.3
LOS	D	B		D	D		D	D		D	D	A
Approach Delay		26.2			38.9			48.2			38.4	
Approach LOS		C			D			D			D	
Queue Length 50th (ft)	34	84		11	233		44	174		41	149	0
Queue Length 95th (ft)	#91	177		35	#359		#99	#290		#101	#254	0
Internal Link Dist (ft)		425			450			281			331	
Turn Bay Length (ft)	390			110			70			245		245
Base Capacity (vph)	132	792		113	755		160	503		158	501	557
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.48	0.34		0.19	0.63		0.51	0.68		0.49	0.59	0.08

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 79
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 38.6 Intersection LOS: D
Intersection Capacity Utilization 66.7% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Birch St/Crystal Ave & NH 102 (E Broadway)



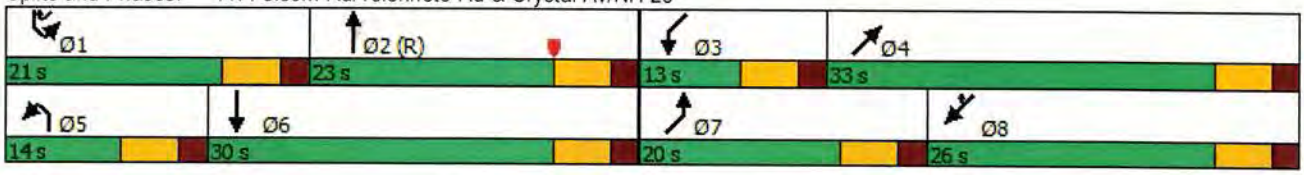
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	220	115	345	270	0	190	280	20	40	370	530
Future Volume (vph)	20	220	115	345	270	0	190	280	20	40	370	530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		90	360		0	190		180	0		210
Storage Lanes	1		1	2		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	3471	1553	3335	3438	0	1752	1845	1568	1752	1845	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	3471	1553	3335	3438	0	1752	1845	1568	1752	1845	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			327						400			182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		639			476			532			387	
Travel Time (s)		14.5			10.8			12.1			8.8	
Peak Hour Factor	0.84	0.84	0.84	0.79	0.79	0.79	0.86	0.86	0.86	0.99	0.99	0.99
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	24	262	137	437	342	0	221	326	23	40	374	535
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	262	137	437	342	0	221	326	23	40	374	535
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	5	2		1	6		7	4		3	8	8 1
Permitted Phases		2	2		6			4	Free		8	
Detector Phase	5	2	2	1	6		7	4		3	8	8 1
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		6.0	8.0		7.0	8.0	
Minimum Split (s)	14.0	21.0	21.0	14.0	21.0		12.0	21.0		13.0	21.0	
Total Split (s)	14.0	23.0	23.0	21.0	30.0		20.0	33.0		13.0	26.0	
Total Split (%)	15.6%	25.6%	25.6%	23.3%	33.3%		22.2%	36.7%		14.4%	28.9%	
Maximum Green (s)	8.0	17.0	17.0	15.0	24.0		14.0	27.0		7.0	20.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	C-Max	C-Max	None	Max		None	None		None	None	
Walk Time (s)		5.0	5.0		5.0			5.0			5.0	
Flash Dont Walk (s)		10.0	10.0		10.0			10.0			10.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effct Green (s)	8.6	18.1	18.1	14.6	24.0		13.5	31.6	90.0	7.0	19.9	40.4
Actuated g/C Ratio	0.10	0.20	0.20	0.16	0.27		0.15	0.35	1.00	0.08	0.22	0.45
v/c Ratio	0.14	0.38	0.24	0.81	0.37		0.84	0.50	0.01	0.29	0.92	0.67
Control Delay	40.2	33.5	1.0	45.9	20.2		65.1	27.9	0.0	45.2	64.3	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	40.2	33.5	1.0	45.9	20.2		65.1	27.9	0.0	45.2	64.3	17.0
LOS	D	C	A	D	C		E	C	A	D	E	B
Approach Delay		23.3			34.6			41.2			36.8	
Approach LOS		C			C			D			D	
Queue Length 50th (ft)	13	69	0	91	85		123	157	0	22	208	149
Queue Length 95th (ft)	35	98	0	131	61		#223	230	0	54	#374	265
Internal Link Dist (ft)		559			396			452			307	
Turn Bay Length (ft)	110		90	360			190		180			210
Base Capacity (vph)	166	696	572	555	916		272	647	1568	136	410	795
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.38	0.24	0.79	0.37		0.81	0.50	0.01	0.29	0.91	0.67

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 30 (33%), Referenced to phase 2:NBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 35.0 Intersection LOS: D
Intersection Capacity Utilization 66.5% ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Folsom Rd/Tsienneto Rd & Crystal Av/NH 28



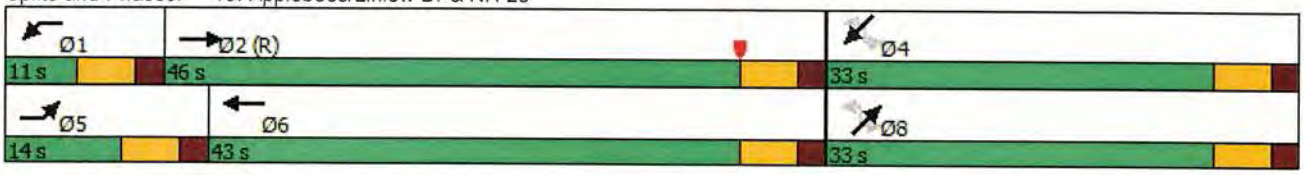
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	825	0	0	830	40	5	0	5	10	0	40
Future Volume (vph)	30	825	0	0	830	40	5	0	5	10	0	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	115		150	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.993				0.850			0.850
Flt Protected	0.950							0.950			0.950	
Satd. Flow (prot)	1687	3374	0	1863	3514	0	0	1805	1615	0	1787	1599
Flt Permitted	0.950							0.976			0.976	
Satd. Flow (perm)	1687	3374	0	1863	3514	0	0	1854	1615	0	1836	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					6				109			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		277			671			218			433	
Travel Time (s)		6.3			15.3			5.0			9.8	
Peak Hour Factor	0.83	0.83	0.83	0.92	0.92	0.92	0.50	0.50	0.50	0.90	0.90	0.90
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	36	994	0	0	902	43	10	0	10	11	0	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	36	994	0	0	945	0	0	10	10	0	11	44
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases					6		8	8	8	4		4
Detector Phase	5	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	46.0		11.0	43.0		33.0	33.0	33.0	33.0	33.0	33.0
Total Split (s)	14.0	46.0		11.0	43.0		33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	15.6%	51.1%		12.2%	47.8%		36.7%	36.7%	36.7%	36.7%	36.7%	36.7%
Maximum Green (s)	8.0	40.0		5.0	37.0		27.0	27.0	27.0	27.0	27.0	27.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
Act Effct Green (s)	8.4	78.7			69.8			6.3	6.3		6.3	6.3
Actuated g/C Ratio	0.09	0.87			0.78			0.07	0.07		0.07	0.07
v/c Ratio	0.23	0.34			0.35			0.08	0.05		0.09	0.21
Control Delay	47.1	1.4			5.2			39.8	0.4		40.0	2.2
Queue Delay	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Delay	47.1	1.4			5.2			39.8	0.4		40.0	2.2
LOS	D	A			A			D	A		D	A
Approach Delay		3.0			5.2			20.1			9.7	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		A			A			C			A	
Queue Length 50th (ft)	22	33			118			6	0		6	0
Queue Length 95th (ft)	m47	42			179			12	0		22	0
Internal Link Dist (ft)		197			591			138			353	
Turn Bay Length (ft)	110											
Base Capacity (vph)	157	2949			2728			556	560		550	556
Starvation Cap Reductn	0	0			0			0	0		0	0
Spillback Cap Reductn	0	0			0			0	0		0	0
Storage Cap Reductn	0	0			0			0	0		0	0
Reduced v/c Ratio	0.23	0.34			0.35			0.02	0.02		0.02	0.08

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 13 (14%), Referenced to phase 2:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.35
Intersection Signal Delay: 4.4 Intersection LOS: A
Intersection Capacity Utilization 47.5% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Applebees/Linlew Dr & NH 28



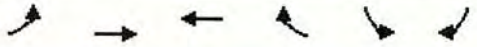
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	830	5	5	875	60	10	5	5	60	5	400
Future Volume (vph)	420	830	5	5	875	60	10	5	5	60	5	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	205		150	0		0	0		220
Storage Lanes	2		0	1		0	1		0	0		1
Taper Length (ft)	200			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.990			0.925				0.850
Flt Protected	0.950			0.950			0.950				0.956	
Satd. Flow (prot)	3303	3402	0	1736	3436	0	1805	1758	0	0	1763	1568
Flt Permitted	0.950			0.950			0.709				0.733	
Satd. Flow (perm)	3303	3402	0	1736	3436	0	1347	1758	0	0	1352	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			10			7				68
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		412			486			151			446	
Travel Time (s)		9.4			11.0			3.4			10.1	
Peak Hour Factor	0.83	0.83	0.83	0.97	0.97	0.97	0.67	0.67	0.67	0.90	0.90	0.90
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Adj. Flow (vph)	506	1000	6	5	902	62	15	7	7	67	6	444
Shared Lane Traffic (%)												
Lane Group Flow (vph)	506	1006	0	5	964	0	15	14	0	0	73	444
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases							8	8		4		
Detector Phase	5	2		1	6		8	8		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	5.0		8.0	8.0	
Minimum Split (s)	14.0	53.0		11.0	22.0		22.0	22.0		22.0	22.0	
Total Split (s)	23.0	57.0		11.0	45.0		22.0	22.0		22.0	22.0	
Total Split (%)	25.6%	63.3%		12.2%	50.0%		24.4%	24.4%		24.4%	24.4%	
Maximum Green (s)	17.0	51.0		5.0	39.0		16.0	16.0		16.0	16.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Min		None	Min		None	None		None	None	
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	16.7	58.0		5.2	37.5		17.8	17.8			17.8	40.5
Actuated g/C Ratio	0.19	0.64		0.06	0.42		0.20	0.20			0.20	0.45
v/c Ratio	0.83	0.46		0.05	0.67		0.06	0.04			0.27	0.60
Control Delay	48.2	9.5		33.2	23.0		30.2	22.0			33.6	19.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	48.2	9.5		33.2	23.0		30.2	22.0			33.6	19.4
LOS	D	A		C	C		C	C			C	B
Approach Delay		22.5			23.0			26.2			21.4	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	143	144		0	184		7	3			33	139
Queue Length 95th (ft)	180	198		m8	177		18	14			77	262
Internal Link Dist (ft)		332			406			71			366	
Turn Bay Length (ft)	200			205								220
Base Capacity (vph)	631	2192		100	1529		271	360			272	737
Starvation Cap Reductn	0	0		0	0		0	0			0	0
Spillback Cap Reductn	0	0		0	0		0	0			0	0
Storage Cap Reductn	0	0		0	0		0	0			0	0
Reduced v/c Ratio	0.80	0.46		0.05	0.63		0.06	0.04			0.27	0.60

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 22.5 Intersection LOS: C
Intersection Capacity Utilization 70.0% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 22: VIP Dr/Connector Rd & NH 28



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	55	1775	1590	220	90	95
Future Volume (vph)	55	1775	1590	220	90	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			150	360	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.077				0.950	
Satd. Flow (perm)	143	3539	3539	1583	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				239		24
Link Speed (mph)		30	30		30	
Link Distance (ft)		463	580		704	
Travel Time (s)		10.5	13.2		16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	1929	1728	239	98	103
Shared Lane Traffic (%)						
Lane Group Flow (vph)	60	1929	1728	239	98	103
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	4	4	5
Permitted Phases	2			6		4
Detector Phase	5	2	6	4	4	5
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	20.0	20.0	11.0	11.0	11.0
Total Split (s)	11.0	66.0	55.0	14.0	14.0	11.0
Total Split (%)	13.8%	82.5%	68.8%	17.5%	17.5%	13.8%
Maximum Green (s)	5.0	60.0	49.0	8.0	8.0	5.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	54.0	54.0	45.8	61.3	7.6	18.9
Actuated g/C Ratio	0.73	0.73	0.62	0.83	0.10	0.26
v/c Ratio	0.28	0.75	0.79	0.18	0.54	0.24
Control Delay	5.8	7.9	14.5	0.6	46.1	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.8	7.9	14.5	0.6	46.1	21.6
LOS	A	A	B	A	D	C
Approach Delay		7.9	12.8		33.5	
Approach LOS		A	B		C	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 50th (ft)	6	217	308	0	48	32
Queue Length 95th (ft)	14	289	405	11	#103	73
Internal Link Dist (ft)		383	500		624	
Turn Bay Length (ft)	200			150	360	
Base Capacity (vph)	217	2848	2409	1332	197	423
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.68	0.72	0.18	0.50	0.24

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 74
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 11.4 Intersection LOS: B
Intersection Capacity Utilization 64.1% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 25: NH 28 & Rockingham Road

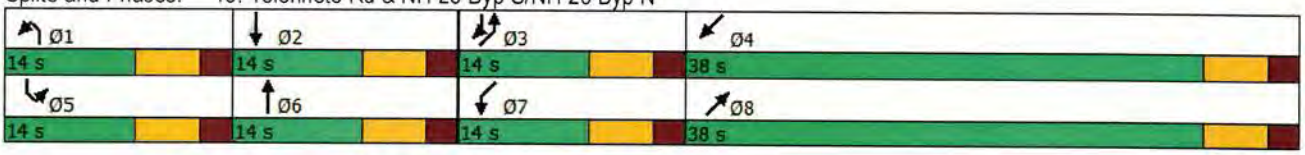
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	50	20	10	40	90	20	230	90	70	280	40
Future Volume (vph)	30	50	20	10	40	90	20	230	90	70	280	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		150	190		190	135		0	120		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.958				0.850		0.958			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1767	0	1736	1827	1553	1770	1785	0	1787	1845	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1767	0	1736	1827	1553	1770	1785	0	1787	1845	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20				123		29			11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		481			347			479			371	
Travel Time (s)		10.9			7.9			10.9			8.4	
Peak Hour Factor	0.82	0.82	0.82	0.81	0.81	0.81	0.68	0.68	0.68	0.78	0.78	0.78
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	37	61	24	12	49	111	29	338	132	90	359	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	85	0	12	49	111	29	470	0	90	410	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	3	3	8		7	4	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	14.0	20.0		14.0	20.0	
Total Split (s)	14.0	14.0		14.0	14.0	14.0	14.0	38.0		14.0	38.0	
Total Split (%)	17.5%	17.5%		17.5%	17.5%	17.5%	17.5%	47.5%		17.5%	47.5%	
Maximum Green (s)	8.0	8.0		8.0	8.0	8.0	8.0	32.0		8.0	32.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	Max	None	None	None		None	None	
Act Effct Green (s)	9.1	11.3		9.1	9.1	25.0	9.1	20.9		9.1	20.9	
Actuated g/C Ratio	0.16	0.19		0.16	0.16	0.43	0.16	0.36		0.16	0.36	
v/c Ratio	0.14	0.24		0.04	0.17	0.15	0.11	0.71		0.32	0.61	
Control Delay	31.0	23.2		30.9	31.1	4.7	30.9	23.1		33.1	20.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	31.0	23.2		30.9	31.1	4.7	30.9	23.1		33.1	20.6	
LOS	C	C		C	C	A	C	C		C	C	
Approach Delay		25.6			14.1			23.6			22.9	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	11	20		4	15	0	9	115		29	99	
Queue Length 95th (ft)	41	66		19	50	23	29	179		76	192	
Internal Link Dist (ft)		401			267			399			291	
Turn Bay Length (ft)	200			190		190	135			120		
Base Capacity (vph)	274	357		271	285	737	276	1094		279	1124	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.14	0.24		0.04	0.17	0.15	0.11	0.43		0.32	0.36	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 58.2
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 22.2 — Intersection LOS: C
Intersection Capacity Utilization 47.6% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 18: Tsienneto Rd & NH 28 Byp S/NH 28 Byp N



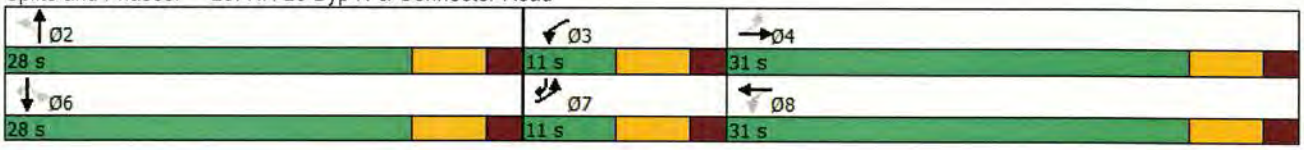
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	350	5	10	380	10	5	50	10	10	50	50
Future Volume (vph)	50	350	5	10	380	10	5	50	10	10	50	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275		0	75		100	75		0	210		210
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.996			0.975				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1859	0	1770	1855	0	1770	1816	0	1770	1863	1583
Flt Permitted	0.297			0.476			0.722			0.715		
Satd. Flow (perm)	553	1859	0	887	1855	0	1345	1816	0	1332	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			2			11				54
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		314			303			290			341	
Travel Time (s)		7.1			6.9			6.6			7.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	380	5	11	413	11	5	54	11	11	54	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	385	0	11	424	0	5	65	0	11	54	54
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		3	8		2	2		6	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	28.0		11.0	28.0		28.0	28.0		28.0	28.0	11.0
Total Split (s)	11.0	31.0		11.0	31.0		28.0	28.0		28.0	28.0	11.0
Total Split (%)	15.7%	44.3%		15.7%	44.3%		40.0%	40.0%		40.0%	40.0%	15.7%
Maximum Green (s)	5.0	25.0		5.0	25.0		22.0	22.0		22.0	22.0	5.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		Max	Max		Max	Max	None
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		15.0			15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	25.9	25.0		22.5	18.7		22.6	22.6		22.6	22.6	33.9
Actuated g/C Ratio	0.42	0.40		0.36	0.30		0.37	0.37		0.37	0.37	0.55
v/c Ratio	0.16	0.51		0.03	0.75		0.01	0.10		0.02	0.08	0.06
Control Delay	10.2	16.8		8.9	29.1		16.4	14.6		16.4	16.5	3.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	10.2	16.8		8.9	29.1		16.4	14.6		16.4	16.5	3.5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	B		A	C		B	B		B	B	A
Approach Delay		16.0			28.6			14.7			10.6	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)	11	94		2	148		1	14		3	14	0
Queue Length 95th (ft)	27	213		9	239		8	42		14	40	17
Internal Link Dist (ft)		234			223			210			261	
Turn Bay Length (ft)	275			75			75			210		210
Base Capacity (vph)	332	871		395	770		490	669		486	680	891
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.16	0.44		0.03	0.55		0.01	0.10		0.02	0.08	0.06

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 61.9
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 20.4 — Intersection LOS: C
Intersection Capacity Utilization 47.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 23: NH 28 Byp N & Connector Road



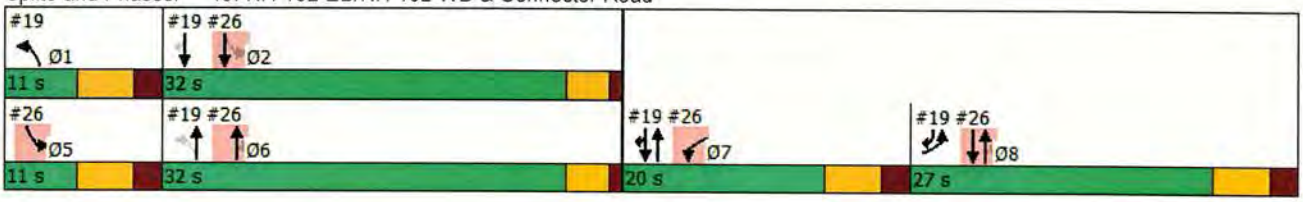
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø2	Ø5	Ø6	Ø7
Lane Configurations										
Traffic Volume (vph)	450	0	20	60	170	580				
Future Volume (vph)	450	0	20	60	170	580				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	0	0	120			90				
Storage Lanes	1	0	1			1				
Taper Length (ft)	25		25							
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Frt						0.850				
Flt Protected	0.950		0.950							
Satd. Flow (prot)	1770	0	1626	1712	1863	1583				
Flt Permitted	0.950		0.580							
Satd. Flow (perm)	1770	0	993	1712	1863	1583				
Right Turn on Red		Yes				Yes				
Satd. Flow (RTOR)						707				
Link Speed (mph)	30			30	30					
Link Distance (ft)	472			739	258					
Travel Time (s)	10.7			16.8	5.9					
Peak Hour Factor	0.94	0.94	0.91	0.91	0.82	0.82				
Heavy Vehicles (%)	2%	2%	11%	11%	2%	2%				
Adj. Flow (vph)	479	0	22	66	207	707				
Shared Lane Traffic (%)										
Lane Group Flow (vph)	479	0	22	66	207	707				
Turn Type	Prot		pm+pt	NA	NA	custom				
Protected Phases	8		1	6 7	2 7	7 8	2	5	6	7
Permitted Phases			6 7			2				
Detector Phase	8		1	6 7	2 7	7 8				
Switch Phase										
Minimum Initial (s)	5.0		5.0				5.0	5.0	5.0	5.0
Minimum Split (s)	26.5		11.0				9.0	11.0	9.0	11.0
Total Split (s)	27.0		11.0				32.0	11.0	32.0	20.0
Total Split (%)	30.0%		12.2%				36%	12%	36%	22%
Maximum Green (s)	21.0		5.0				28.0	5.0	28.0	14.0
Yellow Time (s)	4.0		4.0				3.0	4.0	3.0	4.0
All-Red Time (s)	2.0		2.0				1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0		0.0							
Total Lost Time (s)	6.0		6.0							
Lead/Lag	Lag		Lead				Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes		Yes				Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0		3.0				3.0	3.0	3.0	3.0
Recall Mode	None		None				Min	None	Min	None
Act Effct Green (s)	22.0		34.0	35.3	33.5	63.9				
Actuated g/C Ratio	0.32		0.49	0.51	0.48	0.92				
v/c Ratio	0.86		0.04	0.08	0.23	0.47				
Control Delay	44.3		7.2	8.7	11.8	1.3				
Queue Delay	0.0		0.0	0.0	0.7	0.1				
Total Delay	44.3		7.2	8.7	12.5	1.4				
LOS	D		A	A	B	A				
Approach Delay	44.3			8.3	3.9					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø2	Ø5	Ø6	Ø7
Approach LOS	D			A	A					
Queue Length 50th (ft)	167		4	12	54	0				
Queue Length 95th (ft)	#513		13	37	87	17				
Internal Link Dist (ft)	392			659	178					
Turn Bay Length (ft)			120			90				
Base Capacity (vph)	560		533	946	980	1493				
Starvation Cap Reductn	0		0	0	509	120				
Spillback Cap Reductn	0		0	0	0	0				
Storage Cap Reductn	0		0	0	0	0				
Reduced v/c Ratio	0.86		0.04	0.07	0.44	0.51				

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 69.4
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 17.2 — Intersection LOS: B
Intersection Capacity Utilization 49.7% — ICU Level of Service A
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 19: NH 102 EB/NH 102 WB & Connector Road



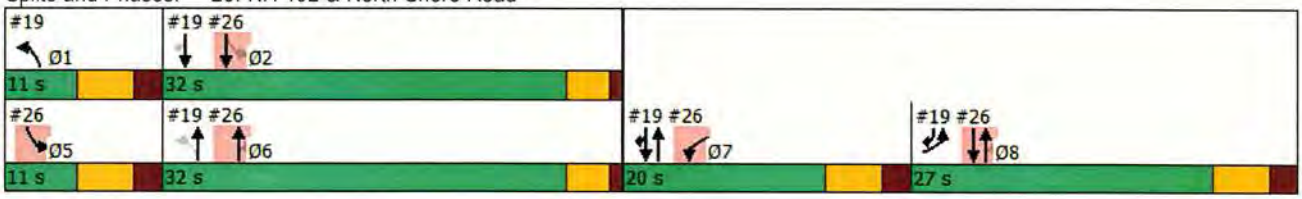
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø1	Ø2	Ø6	Ø8
Lane Configurations										
Traffic Volume (vph)	70	10	460	50	10	680				
Future Volume (vph)	70	10	460	50	10	680				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	0	0		90	100					
Storage Lanes	1	0		1	1					
Taper Length (ft)	25				25					
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Frt	0.979			0.850						
Flt Protected	0.960				0.950					
Satd. Flow (prot)	1771	0	1900	1615	1805	1900				
Flt Permitted	0.960				0.257					
Satd. Flow (perm)	1771	0	1900	1615	488	1900				
Right Turn on Red		Yes		Yes						
Satd. Flow (RTOR)	9			53						
Link Speed (mph)	30		30			30				
Link Distance (ft)	524		258			288				
Travel Time (s)	11.9		5.9			6.5				
Peak Hour Factor	0.87	0.67	0.95	0.84	0.73	0.96				
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%				
Adj. Flow (vph)	80	15	484	60	14	708				
Shared Lane Traffic (%)										
Lane Group Flow (vph)	95	0	484	60	14	708				
Turn Type	Prot		NA	Perm	custom	NA				
Protected Phases	7		6 8		5	2 8	1	2	6	8
Permitted Phases				6 8	2					
Detector Phase	7		6 8	6 8	5	2 8				
Switch Phase										
Minimum Initial (s)	5.0				5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	11.0				11.0		11.0	9.0	9.0	26.5
Total Split (s)	20.0				11.0		11.0	32.0	32.0	27.0
Total Split (%)	22.2%				12.2%		12%	36%	36%	30%
Maximum Green (s)	14.0				5.0		5.0	28.0	28.0	21.0
Yellow Time (s)	4.0				4.0		4.0	3.0	3.0	4.0
All-Red Time (s)	2.0				2.0		2.0	1.0	1.0	2.0
Lost Time Adjust (s)	0.0				0.0					
Total Lost Time (s)	6.0				6.0					
Lead/Lag	Lead				Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes				Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0				3.0		3.0	3.0	3.0	3.0
Recall Mode	None				None		None	Min	Min	None
Act Effct Green (s)	11.6		45.1	45.1	15.1	42.6				
Actuated g/C Ratio	0.17		0.65	0.65	0.22	0.61				
v/c Ratio	0.31		0.39	0.06	0.07	0.61				
Control Delay	29.8		3.4	0.7	18.1	9.3				
Queue Delay	0.0		0.2	0.0	0.0	0.0				
Total Delay	29.8		3.5	0.7	18.1	9.3				
LOS	C		A	A	B	A				
Approach Delay	29.8		3.2			9.5				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø1	Ø2	Ø6	Ø8
Approach LOS	C		A			A				
Queue Length 50th (ft)	28		7	0	5	135				
Queue Length 95th (ft)	87		m79	m0	13	209				
Internal Link Dist (ft)	444		178			208				
Turn Bay Length (ft)				90	100					
Base Capacity (vph)	380		1552	1329	205	1515				
Starvation Cap Reductn	0		403	0	0	0				
Spillback Cap Reductn	0		0	0	0	0				
Storage Cap Reductn	0		0	0	0	0				
Reduced v/c Ratio	0.25		0.42	0.05	0.07	0.47				

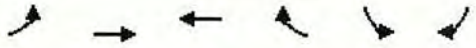
Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 69.4
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 8.4 Intersection LOS: A
Intersection Capacity Utilization 48.6% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

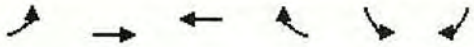
Splits and Phases: 26: NH 102 & North Shore Road



APPENDIX Q-4: ALTERNATIVE C INTERSECTION CAPACITY ANALYSES – SYNCHRO PRINTSOUTS – PM PEAK HOUR



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1255	1330	0	125	1325
Future Volume (vph)	0	1255	1330	0	125	1325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.88
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3471	3406	0	1930	2682
Flt Permitted					0.950	
Satd. Flow (perm)	0	3471	3406	0	1930	2682
Right Turn on Red				Yes		No
Satd. Flow (RTOR)						
Link Speed (mph)		30	30		25	
Link Distance (ft)		712	388		212	
Travel Time (s)		16.2	8.8		5.8	
Peak Hour Factor	0.93	0.93	0.88	0.88	0.89	0.89
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Adj. Flow (vph)	0	1349	1511	0	140	1489
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1349	1511	0	140	1489
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		24	24		16	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	0.85	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors		3	3		3	3
Detector Template		Thru	Thru		Left	
Leading Detector (ft)		256	256		256	256
Trailing Detector (ft)		-5	-5		-5	-5
Detector 1 Position(ft)		-5	-5		-5	-5
Detector 1 Size(ft)		50	50		50	50
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		125	125		125	125
Detector 2 Size(ft)		6	6		6	6
Detector 2 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0		0.0	0.0
Detector 3 Position(ft)		250	250		250	250
Detector 3 Size(ft)		6	6		6	6
Detector 3 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 3 Channel						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 3 Extend (s)		0.0	0.0		0.0	0.0
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0		5.0	5.0
Minimum Split (s)		14.0	21.0		27.0	27.0
Total Split (s)		63.0	63.0		77.0	77.0
Total Split (%)		45.0%	45.0%		55.0%	55.0%
Maximum Green (s)		57.0	57.0		71.0	71.0
Yellow Time (s)		2.0	2.0		2.0	2.0
All-Red Time (s)		4.0	4.0		4.0	4.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		14.0	14.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		57.0	57.0		71.0	71.0
Actuated g/C Ratio		0.41	0.41		0.51	0.51
v/c Ratio		0.95	1.09		0.14	1.09
Control Delay		40.2	50.4		18.8	88.1
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		40.2	50.4		18.8	88.1
LOS		D	D		B	F
Approach Delay		40.2	50.4		82.1	
Approach LOS		D	D		F	
Queue Length 50th (ft)		494	~818		66	~868
Queue Length 95th (ft)		m#739	m#55		105	#1000
Internal Link Dist (ft)		632	308		132	
Turn Bay Length (ft)						
Base Capacity (vph)		1413	1386		978	1360
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.95	1.09		0.14	1.09

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.09	

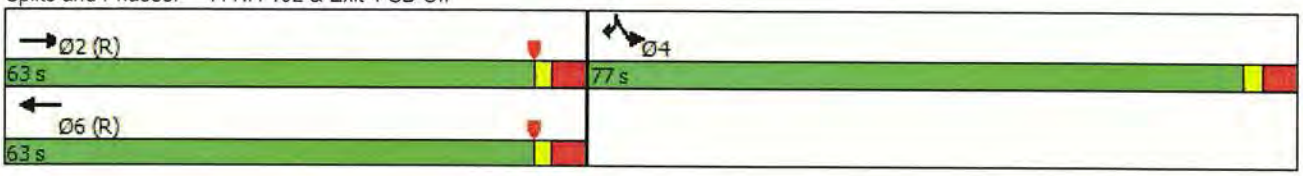
Intersection Signal Delay: 58.9 Intersection LOS: E
Intersection Capacity Utilization 95.1% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: NH 102 & Exit 4 SB Off



Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	1250	0	910	0	0	1085	295	0	0	420	240
Future Volume (vph)	1250	0	910	0	0	1085	295	0	0	420	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0	0	0	550		0	0		0
Storage Lanes		2	2	0	0	2		0	0		1
Taper Length (ft)		25		25		25			25		
Lane Util. Factor	0.97	1.00	0.88	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt			0.850								0.850
Flt Protected	0.950					0.950					
Satd. Flow (prot)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Flt Permitted	0.950					0.950					
Satd. Flow (perm)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Right Turn on Red			No					Yes			Yes
Satd. Flow (RTOR)											261
Link Speed (mph)		25		30			30			30	
Link Distance (ft)		856		390			760			857	
Travel Time (s)		23.3		8.9			17.3			19.5	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Adj. Flow (vph)	1420	0	1034	0	0	1154	314	0	0	457	261
Shared Lane Traffic (%)											
Lane Group Flow (vph)	1420	0	1034	0	0	1154	314	0	0	457	261
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		24		0			24			24	
Link Offset(ft)		12		0			0			0	
Crosswalk Width(ft)		16		16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	25	15	9	15		9	15		25
Number of Detectors	3		3			3	3			3	0
Detector Template											
Leading Detector (ft)	256		256			256	256			256	0
Trailing Detector (ft)	-5		-5			-5	-5			-5	0
Detector 1 Position(ft)	-5		-5			-5	-5			-5	-5
Detector 1 Size(ft)	55		55			55	55			55	50
Detector 1 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Queue (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Delay (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 2 Position(ft)	125		125			125	125			125	
Detector 2 Size(ft)	6		6			6	6			6	
Detector 2 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	
Detector 2 Channel											
Detector 2 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Detector 3 Position(ft)	250		250			250	250			250	
Detector 3 Size(ft)	6		6			6	6			6	

Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	CI+Ex		CI+Ex			CI+Ex	CI+Ex			CI+Ex	
Detector 3 Channel											
Detector 3 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Detector Phase	8		2			5	2			6	
Switch Phase											
Minimum Initial (s)	10.0		10.0			5.0	8.0			8.0	
Minimum Split (s)	16.0		16.0			11.0	42.0			31.0	
Total Split (s)	60.0		60.0			48.0	80.0			32.0	
Total Split (%)	42.9%		42.9%			34.3%	57.1%			22.9%	
Maximum Green (s)	54.0		54.0			42.0	74.0			26.0	
Yellow Time (s)	2.0		2.0			2.0	2.0			2.0	
All-Red Time (s)	4.0		4.0			4.0	4.0			4.0	
Lost Time Adjust (s)	0.0		0.0			0.0	0.0			0.0	
Total Lost Time (s)	6.0		6.0			6.0	6.0			6.0	
Lead/Lag						Lead				Lag	
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Recall Mode	None		None			None	C-Min			C-Min	
Walk Time (s)							7.0			7.0	
Flash Dont Walk (s)							29.0			17.0	
Pedestrian Calls (#/hr)							0			0	
Act Effct Green (s)	54.0		54.0			42.0	74.0			26.0	140.0
Actuated g/C Ratio	0.39		0.39			0.30	0.53			0.19	1.00
v/c Ratio	1.14		1.02			1.15	0.17			0.70	0.17
Control Delay	111.0		75.3			98.3	2.8			60.0	0.2
Queue Delay	0.0		0.0			0.0	0.0			0.0	0.0
Total Delay	111.0		75.3			98.3	2.8			60.0	0.2
LOS	F		E			F	A			E	A
Approach Delay		96.0					77.9			38.3	
Approach LOS		F					E			D	
Queue Length 50th (ft)	~774		~565			~625	20			207	0
Queue Length 95th (ft)	#877		#685			m#680	m21			270	0
Internal Link Dist (ft)		776		310			680			777	
Turn Bay Length (ft)						550					
Base Capacity (vph)	1250		1015			1000	1817			650	1568
Starvation Cap Reductn	0		0			0	0			0	0
Spillback Cap Reductn	0		0			0	0			0	0
Storage Cap Reductn	0		0			0	0			0	0
Reduced v/c Ratio	1.14		1.02			1.15	0.17			0.70	0.17

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 53 (38%), Referenced to phase 2:NET and 6:SWT, Start of Yellow	
Natural Cycle: 150	

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.15
Intersection Signal Delay: 81.3 Intersection LOS: F
Intersection Capacity Utilization 94.2% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: NH 102 & Exit 4 NB Off

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	640	470	160	615	0	0	0	0	180	0	390
Future Volume (vph)	0	640	470	160	615	0	0	0	0	180	0	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		350	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3471	1553	1719	3438	0	0	0	0	3367	0	1553
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	3471	1553	1719	3438	0	0	0	0	3367	0	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			540									203
Link Speed (mph)		30			30			30			35	
Link Distance (ft)		851			693			486			581	
Travel Time (s)		19.3			15.8			11.0			11.3	
Peak Hour Factor	0.87	0.87	0.87	0.86	0.86	0.86	0.92	0.92	0.92	0.91	0.91	0.91
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	0	736	540	186	715	0	0	0	0	198	0	429
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	736	540	186	715	0	0	0	0	198	0	429
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Right	Left	Right
Median Width(ft)		36			36			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		25	15		9	15		9	15		25
Number of Detectors		3	3	3	3					3		3
Detector Template		Thru	Right	Left	Thru					Left		Right
Leading Detector (ft)		256	256	256	256					256		256
Trailing Detector (ft)		-5	-5	-5	-5					-5		-5
Detector 1 Position(ft)		-5	-5	-5	-5					-5		-5
Detector 1 Size(ft)		50	50	50	50					50		50
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 2 Position(ft)		125	125	125	125					125		125
Detector 2 Size(ft)		6	6	6	6					6		6
Detector 2 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 3 Position(ft)		250	250	250	250					250		250
Detector 3 Size(ft)		6	6	6	6					6		6

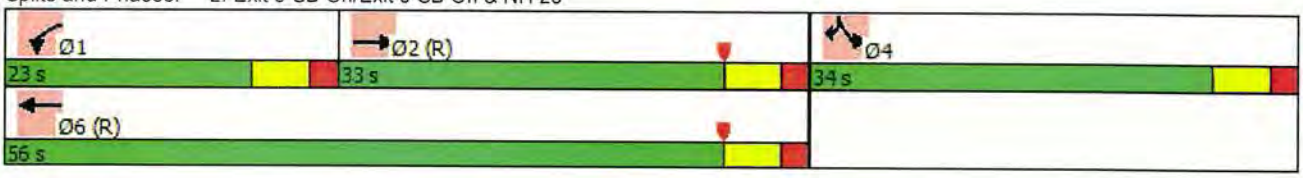
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 3 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 3 Channel												
Detector 3 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Detector Phase		2		1	6					4		4
Switch Phase												
Minimum Initial (s)		9.0		4.0	9.0					4.0		4.0
Minimum Split (s)		21.0		10.0	21.0					10.0		10.0
Total Split (s)		33.0		23.0	56.0					34.0		34.0
Total Split (%)		36.7%		25.6%	62.2%					37.8%		37.8%
Maximum Green (s)		27.0		17.0	50.0					28.0		28.0
Yellow Time (s)		4.0		4.0	4.0					4.0		4.0
All-Red Time (s)		2.0		2.0	2.0					2.0		2.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0					6.0		6.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Recall Mode		C-Min		None	C-Min					None		None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		8.0			8.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)		36.1	90.0	14.2	56.3					21.7		21.7
Actuated g/C Ratio		0.40	1.00	0.16	0.63					0.24		0.24
v/c Ratio		0.53	0.35	0.69	0.33					0.24		0.81
Control Delay		24.5	0.6	21.4	0.4					26.6		28.6
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		24.5	0.6	21.4	0.4					26.6		28.6
LOS		C	A	C	A					C		C
Approach Delay		14.4			4.7						28.0	
Approach LOS		B			A						C	
Queue Length 50th (ft)		172	0	5	0					45		120
Queue Length 95th (ft)		247	0	m0	m0					68		221
Internal Link Dist (ft)		771			613			406			501	
Turn Bay Length (ft)			350									
Base Capacity (vph)		1392	1553	324	2151					1047		623
Starvation Cap Reductn		0	0	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.53	0.35	0.57	0.33					0.19		0.69

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 51 (57%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 60

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 14.3 Intersection LOS: B
Intersection Capacity Utilization 70.4% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Exit 5 SB On/Exit 5 SB Off & NH 28



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	440	380	0	0	455	230	320	0	370	0	0	0
Future Volume (vph)	440	380	0	0	455	230	320	0	370	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1752	3505	0	0	3505	1568	1703	0	1524	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1752	3505	0	0	3505	1568	1703	0	1524	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						253			418			
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		693			542			867			392	
Travel Time (s)		15.8			12.3			16.9			8.9	
Peak Hour Factor	0.92	0.92	0.92	0.91	0.91	0.91	0.67	0.67	0.67	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	6%	6%	6%	2%	2%	2%
Adj. Flow (vph)	478	413	0	0	500	253	478	0	552	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	478	413	0	0	500	253	478	0	552	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Right	Left	Right	Left	Left	Right
Median Width(ft)		36			42			12			12	
Link Offset(ft)		0			0			0			36	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		25	15		25	15		9
Number of Detectors	3	3			3	3	3		0			
Detector Template	Left					Right	Left					
Leading Detector (ft)	256	256			256	256	256		0			
Trailing Detector (ft)	-5	-5			-5	-5	-5		0			
Detector 1 Position(ft)	-5	-5			-5	-5	-5		-5			
Detector 1 Size(ft)	50	50			50	50	50		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 2 Position(ft)	125	125			125	125	125					
Detector 2 Size(ft)	6	6			6	6	6					
Detector 2 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex					
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0			0.0	0.0	0.0					
Detector 3 Position(ft)	250	250			250	250	250					
Detector 3 Size(ft)	6	6			6	6	6					
Detector 3 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex					
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0			0.0	0.0	0.0					

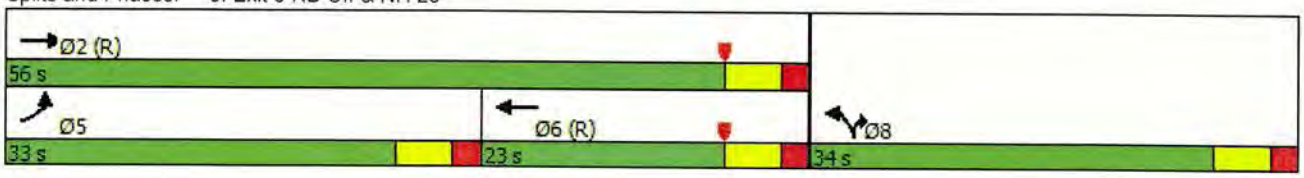
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Detector Phase	5	2			6		8		8			
Switch Phase												
Minimum Initial (s)	4.0	16.0			16.0		4.0		4.0			
Minimum Split (s)	10.0	23.0			23.0		11.0		11.0			
Total Split (s)	33.0	56.0			23.0		34.0		34.0			
Total Split (%)	36.7%	62.2%			25.6%		37.8%		37.8%			
Maximum Green (s)	27.0	50.0			17.0		28.0		28.0			
Yellow Time (s)	4.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	2.0	2.0			2.0		2.0		2.0			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.0		6.0		6.0			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		10.0			10.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	26.9	50.1			17.1	90.0	27.9		27.9			
Actuated g/C Ratio	0.30	0.56			0.19	1.00	0.31		0.31			
v/c Ratio	0.91	0.21			0.75	0.16	0.91		0.73			
Control Delay	31.8	3.6			42.5	0.2	53.0		13.2			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	31.8	3.6			42.5	0.2	53.0		13.2			
LOS	C	A			D	A	D		B			
Approach Delay		18.8			28.3			31.7				
Approach LOS		B			C			C				
Queue Length 50th (ft)	261	10			142	0	258		57			
Queue Length 95th (ft)	#440	9			198	0	254		48			
Internal Link Dist (ft)		613			462			787			312	
Turn Bay Length (ft)												
Base Capacity (vph)	525	1949			667	1568	529		762			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.91	0.21			0.75	0.16	0.90		0.72			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 26.4 Intersection LOS: C

Intersection Capacity Utilization 70.4% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Exit 5 NB Off & NH 28



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	5	210	10	0	10	270	820	120	5	590	130
Future Volume (vph)	10	5	210	10	0	10	270	820	120	5	590	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		225	0		0	350		0	100		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.932			0.981			0.973	
Flt Protected		0.967			0.976		0.950			0.950		
Satd. Flow (prot)	0	1801	1583	0	1728	0	1770	3472	0	1770	3444	0
Flt Permitted		0.871			0.834		0.950			0.950		
Satd. Flow (perm)	0	1622	1583	0	1477	0	1770	3472	0	1770	3444	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			228		182			28			31	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		593			447			750			330	
Travel Time (s)		13.5			10.2			17.0			7.5	
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	11	5	228	40	0	40	293	891	130	5	641	141
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	228	0	80	0	293	1021	0	5	782	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	3	1	3	1		3	3		3	3	
Detector Template	Left	Thru	Right	Left			Left	Thru		Left	Thru	
Leading Detector (ft)	256	256	45	256	45		256	256		256	256	
Trailing Detector (ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Position(ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	125	125		125			125	125		125	125	
Detector 2 Size(ft)	6	6		6			6	6		6	6	
Detector 2 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Detector 3 Position(ft)	250	250		250			250	250		250	250	
Detector 3 Size(ft)	6	6		6			6	6		6	6	

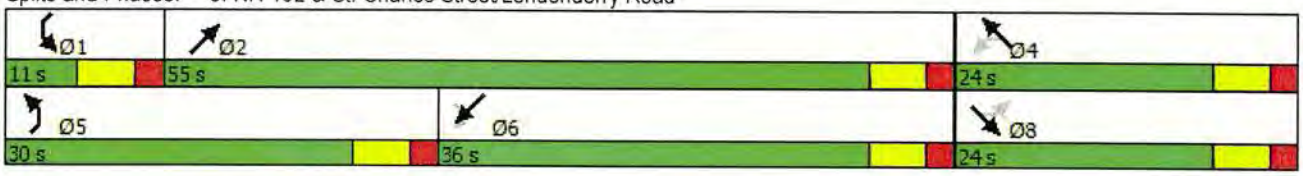
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	custom	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Detector Phase	8	8	6	4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	8.0	5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		24.0	24.0		11.0	24.0	
Total Split (s)	24.0	24.0	36.0	24.0	24.0		30.0	55.0		11.0	36.0	
Total Split (%)	26.7%	26.7%	40.0%	26.7%	26.7%		33.3%	61.1%		12.2%	40.0%	
Maximum Green (s)	18.0	18.0	30.0	18.0	18.0		24.0	49.0		5.0	30.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lead/Lag			Lag				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	Min	None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0			0	
Act Effct Green (s)		6.8	27.1		6.8		16.9	50.8		5.4	27.1	
Actuated g/C Ratio		0.10	0.41		0.10		0.26	0.77		0.08	0.41	
v/c Ratio		0.10	0.29		0.25		0.65	0.38		0.03	0.55	
Control Delay		33.5	3.7		1.9		31.0	4.8		34.8	17.5	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		33.5	3.7		1.9		31.0	4.8		34.8	17.5	
LOS		C	A		A		C	A		C	B	
Approach Delay		5.7			1.9			10.7			17.6	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)		7	0		0		118	63		2	127	
Queue Length 95th (ft)		26	43		0		199	170		13	212	
Internal Link Dist (ft)		513			367			670			250	
Turn Bay Length (ft)			225				350			100		
Base Capacity (vph)		475	890		561		692	2683		144	1700	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.03	0.26		0.14		0.42	0.38		0.03	0.46	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 66.2
Natural Cycle: 75
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.65
Intersection Signal Delay: 12.1 Intersection LOS: B
Intersection Capacity Utilization 62.0% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 9: NH 102 & St. Charles Street/Londonderry Road



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	20	5	270	0	50	0	730	130	10	380	0
Future Volume (vph)	20	20	5	270	0	50	0	730	130	10	380	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.985			0.979			0.980				
Flt Protected		0.978			0.960						0.999	
Satd. Flow (prot)	0	1794	0	0	1734	0	0	1724	0	0	1808	0
Flt Permitted		0.834			0.708						0.890	
Satd. Flow (perm)	0	1530	0	0	1279	0	0	1724	0	0	1610	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			36			18				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		356			493			1124			603	
Travel Time (s)		8.1			11.2			25.5			13.7	
Peak Hour Factor	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Adj. Flow (vph)	33	33	8	281	0	52	0	820	146	12	442	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	74	0	0	333	0	0	966	0	0	454	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		-22			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	1		3	2			2		3	2	
Detector Template	Left			Left						Left		
Leading Detector (ft)	256	45		256	131			131		256	131	
Trailing Detector (ft)	-5	-5		-5	-5			-5		-5	-5	
Detector 1 Position(ft)	-5	-5		-5	-5			-5		-5	-5	
Detector 1 Size(ft)	50	50		50	50			50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 2 Position(ft)	125			125	125			125		125	125	
Detector 2 Size(ft)	6			6	6			6		6	6	
Detector 2 Type	Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0	0.0			0.0		0.0	0.0	
Detector 3 Position(ft)	250			250						250		
Detector 3 Size(ft)	6			6						6		
Detector 3 Type	Cl+Ex			Cl+Ex						Cl+Ex		
Detector 3 Channel												
Detector 3 Extend (s)	0.0			0.0						0.0		

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Detector Phase	4	4		4	4			2		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0			24.0		24.0	24.0	
Total Split (s)	29.0	29.0		29.0	29.0			61.0		61.0	61.0	
Total Split (%)	32.2%	32.2%		32.2%	32.2%			67.8%		67.8%	67.8%	
Maximum Green (s)	23.0	23.0		23.0	23.0			55.0		55.0	55.0	
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Recall Mode	None	None		None	None			Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		22.3			22.3			52.1			52.1	
Actuated g/C Ratio		0.26			0.26			0.60			0.60	
v/c Ratio		0.18			0.94			0.92			0.47	
Control Delay		25.7			64.8			31.3			11.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		25.7			64.8			31.3			11.5	
LOS		C			E			C			B	
Approach Delay		25.7			64.8			31.3			11.5	
Approach LOS		C			E			C			B	
Queue Length 50th (ft)		30			168			433			128	
Queue Length 95th (ft)		41			#338			#735			183	
Internal Link Dist (ft)		276			413			1044			523	
Turn Bay Length (ft)												
Base Capacity (vph)		415			368			1111			1031	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.18			0.90			0.87			0.44	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 86.5			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 32.3		Intersection LOS: C	
Intersection Capacity Utilization 84.3%		ICU Level of Service E	

Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: NH 102 & Fordway/Madden Hill Road

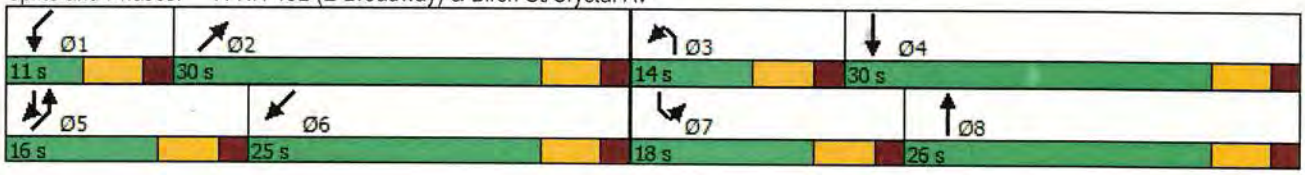
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	70	310	20	130	400	60	80	390	30	50	270	60
Future Volume (vph)	70	310	20	130	400	60	80	390	30	50	270	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	70		0	245		245	390		0	110		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.991				0.850		0.989			0.973	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1828	0	1752	1845	1568	1787	1860	0	1787	1830	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1828	0	1752	1845	1568	1787	1860	0	1787	1830	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				116		5			12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		361			411			477			530	
Travel Time (s)		8.2			9.3			10.8			12.0	
Peak Hour Factor	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95	0.94	0.94	0.94
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	77	341	22	140	430	65	84	411	32	53	287	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	77	363	0	140	430	65	84	443	0	53	351	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4	5	5	2		1	6	
Permitted Phases						4						
Detector Phase	3	8		7	4	5	5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	10.0	4.0	4.0	10.0		4.0	9.0	
Minimum Split (s)	10.0	24.0		11.0	24.0	16.0	16.0	24.0		11.0	24.0	
Total Split (s)	14.0	26.0		18.0	30.0	16.0	16.0	30.0		11.0	25.0	
Total Split (%)	16.5%	30.6%		21.2%	35.3%	18.8%	18.8%	35.3%		12.9%	29.4%	
Maximum Green (s)	8.0	20.0		12.0	24.0	10.0	10.0	24.0		5.0	19.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Max		None	None	
Act Effct Green (s)	7.5	18.7		10.6	21.3	36.1	8.6	26.7		5.2	21.5	
Actuated g/C Ratio	0.10	0.24		0.14	0.28	0.47	0.11	0.35		0.07	0.28	
v/c Ratio	0.45	0.81		0.58	0.84	0.08	0.42	0.68		0.43	0.68	
Control Delay	45.3	45.4		44.4	44.1	0.8	41.9	32.2		50.7	36.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	45.3	45.4		44.4	44.1	0.8	41.9	32.2		50.7	36.7	
LOS	D	D		D	D	A	D	C		D	D	
Approach Delay		45.3			39.8			33.7			38.5	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		D			D			C			D	
Queue Length 50th (ft)	40	183		71	214	0	43	219		28	172	
Queue Length 95th (ft)	83	#331		129	#368	5	87	#379		#74	#321	
Internal Link Dist (ft)		281			331			397			450	
Turn Bay Length (ft)	70			245		245	390			110		
Base Capacity (vph)	190	501		286	603	836	243	650		122	523	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.41	0.72		0.49	0.71	0.08	0.35	0.68		0.43	0.67	

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 76.7
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 39.2 Intersection LOS: D
Intersection Capacity Utilization 87.2% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: NH 102 (E Broadway) & Birch St/Crystal Av



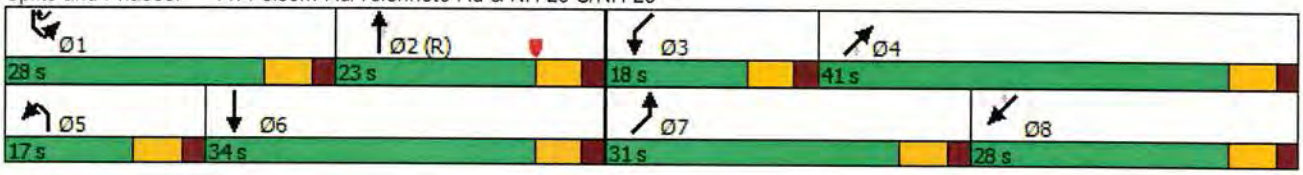
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	80	330	140	560	530	0	320	500	120	50	290	590
Future Volume (vph)	80	330	140	560	530	0	320	500	120	50	290	590
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		90	360		0	190		180	0		210
Storage Lanes	1		1	2		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	3433	3539	0	1770	1863	1583	1787	1881	1599
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	3433	3539	0	1770	1863	1583	1787	1881	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			268						208			149
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		639			495			532			387	
Travel Time (s)		14.5			11.3			12.1			8.8	
Peak Hour Factor	0.92	0.92	0.92	0.94	0.94	0.94	0.96	0.96	0.96	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	87	359	152	596	564	0	333	521	125	53	305	621
Shared Lane Traffic (%)												
Lane Group Flow (vph)	87	359	152	596	564	0	333	521	125	53	305	621
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6		7	4		3	8	1
Permitted Phases			2						4			8
Detector Phase	5	2	2	1	6		7	4	4	3	8	1
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	14.0	22.0	22.0	14.0	22.0		14.0	22.0	22.0	14.0	22.0	14.0
Total Split (s)	17.0	23.0	23.0	28.0	34.0		31.0	41.0	41.0	18.0	28.0	28.0
Total Split (%)	15.5%	20.9%	20.9%	25.5%	30.9%		28.2%	37.3%	37.3%	16.4%	25.5%	25.5%
Maximum Green (s)	11.0	17.0	17.0	22.0	28.0		25.0	35.0	35.0	12.0	22.0	22.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	None		None	None	None	None	None	None
Walk Time (s)		5.0	5.0		5.0			5.0	5.0		5.0	
Flash Dont Walk (s)		11.0	11.0		11.0			11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0			0	0		0	
Act Effct Green (s)	9.9	19.9	19.9	22.1	34.8		23.4	37.6	37.6	9.3	20.6	48.7
Actuated g/C Ratio	0.09	0.18	0.18	0.20	0.32		0.21	0.34	0.34	0.08	0.19	0.44
v/c Ratio	0.54	0.56	0.30	0.87	0.50		0.89	0.82	0.18	0.35	0.87	0.79
Control Delay	60.7	46.1	1.5	69.2	34.7		67.2	45.7	0.6	53.8	67.4	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	60.7	46.1	1.5	69.2	34.7		67.2	45.7	0.6	53.8	67.4	27.5
LOS	E	D	A	E	C		E	D	A	D	E	C
Approach Delay		36.9			52.4			47.3			41.4	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	59	126	0	184	121		225	329	0	36	207	280
Queue Length 95th (ft)	112	177	0	#316	200		#374	#536	0	75	#345	438
Internal Link Dist (ft)		559			415			452			307	
Turn Bay Length (ft)	110		90	360			190		180			210
Base Capacity (vph)	177	640	506	700	1120		402	636	677	194	376	795
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.56	0.30	0.85	0.50		0.83	0.82	0.18	0.27	0.81	0.78

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 16 (15%), Referenced to phase 2:NBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 45.7 Intersection LOS: D
Intersection Capacity Utilization 78.4% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Folsom Rd/Tsienneto Rd & NH 28 S/NH 28



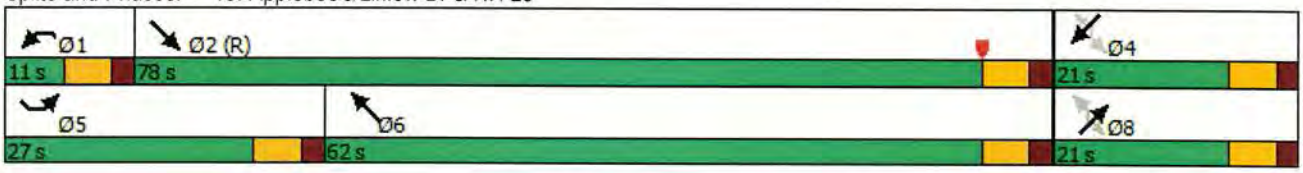
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	90	1225	5	20	1030	100	15	10	15	10	10	30
Future Volume (vph)	90	1225	5	20	1030	100	15	10	15	10	10	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	115		0	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.987				0.850			0.850
Flt Protected	0.950			0.950				0.971			0.976	
Satd. Flow (prot)	1787	3571	0	1787	3528	0	0	1845	1615	0	1836	1599
Flt Permitted	0.950			0.950				0.799			0.827	
Satd. Flow (perm)	1787	3571	0	1787	3528	0	0	1518	1615	0	1556	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			13				149			149
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		277			652			230			387	
Travel Time (s)		6.3			14.8			5.2			8.8	
Peak Hour Factor	0.97	0.97	0.97	0.95	0.95	0.95	0.90	0.90	0.90	0.80	0.80	0.80
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	93	1263	5	21	1084	105	17	11	17	13	13	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	93	1268	0	21	1189	0	0	28	17	0	26	38
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4	4	4
Detector Phase	5	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	26.0	63.0		11.0	48.0		21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	27.0	78.0		11.0	62.0		21.0	21.0	21.0	21.0	21.0	21.0
Total Split (%)	24.5%	70.9%		10.0%	56.4%		19.1%	19.1%	19.1%	19.1%	19.1%	19.1%
Maximum Green (s)	21.0	72.0		5.0	56.0		15.0	15.0	15.0	15.0	15.0	15.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	Max		None	None	None	None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0			11.0		8.0	8.0	8.0	8.0	8.0	8.0
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	0
Act Effct Green (s)	11.0	88.4		6.9	79.5			7.5	7.5		7.5	7.5
Actuated g/C Ratio	0.10	0.80		0.06	0.72			0.07	0.07		0.07	0.07
v/c Ratio	0.52	0.44		0.19	0.47			0.27	0.07		0.25	0.15
Control Delay	54.5	9.2		51.0	10.5			54.6	0.5		53.5	1.3
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	54.5	9.2		51.0	10.5			54.6	0.5		53.5	1.3
LOS	D	A		D	B			D	A		D	A
Approach Delay		12.3			11.2			34.1			22.5	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)	63	247		15	221			19	0		18	0
Queue Length 95th (ft)	m96	442		m20	280			48	0		40	0
Internal Link Dist (ft)		197			572			150			307	
Turn Bay Length (ft)	100			115								
Base Capacity (vph)	341	2868		111	2554			207	348		212	346
Starvation Cap Reductn	0	0		0	0			0	0		0	0
Spillback Cap Reductn	0	0		0	0			0	0		0	0
Storage Cap Reductn	0	0		0	0			0	0		0	0
Reduced v/c Ratio	0.27	0.44		0.19	0.47			0.14	0.05		0.12	0.11

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 49 (45%), Referenced to phase 2:SET, Start of Yellow
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 12.4 Intersection LOS: B
Intersection Capacity Utilization 61.2% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Applebee's/Linlew Dr & NH 28



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	530	1270	5	5	1080	70	40	10	10	80	5	490
Future Volume (vph)	530	1270	5	5	1080	70	40	10	10	80	5	490
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		150	205		150	0		0	0		220
Storage Lanes	2		0	1		0	1		0	0		1
Taper Length (ft)	150			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.991			0.925				0.850
Flt Protected	0.950			0.950			0.950				0.955	
Satd. Flow (prot)	3467	3571	0	1770	3507	0	1805	1758	0	0	1814	1615
Flt Permitted	0.950			0.950			0.693				0.720	
Satd. Flow (perm)	3467	3571	0	1770	3507	0	1317	1758	0	0	1368	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			7			13				30
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		877			314			151			476	
Travel Time (s)		19.9			7.1			3.4			10.8	
Peak Hour Factor	0.84	0.84	0.84	0.90	0.90	0.90	0.78	0.78	0.78	0.86	0.86	0.86
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	631	1512	6	6	1200	78	51	13	13	93	6	570
Shared Lane Traffic (%)												
Lane Group Flow (vph)	631	1518	0	6	1278	0	51	26	0	0	99	570
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases							8	8		4		4
Detector Phase	5	2		1	6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	5.0		8.0	8.0	5.0
Minimum Split (s)	11.0	53.0		11.0	50.0		22.0	22.0		22.0	22.0	11.0
Total Split (s)	34.0	72.0		11.0	49.0		27.0	27.0		27.0	27.0	34.0
Total Split (%)	30.9%	65.5%		10.0%	44.5%		24.5%	24.5%		24.5%	24.5%	30.9%
Maximum Green (s)	28.0	66.0		5.0	43.0		21.0	21.0		21.0	21.0	28.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	None		None	None		None	None	None
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	29.0	82.1		6.0	49.7		13.3	13.3			13.3	48.3
Actuated g/C Ratio	0.26	0.75		0.05	0.45		0.12	0.12			0.12	0.44
v/c Ratio	0.69	0.57		0.06	0.80		0.32	0.12			0.60	0.79
Control Delay	40.5	8.6		41.2	47.6		47.9	26.9			59.8	32.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	40.5	8.6		41.2	47.6		47.9	26.9			59.8	32.6
LOS	D	A		D	D		D	C			E	C
Approach Delay		18.0			47.5			40.8			36.7	
Approach LOS		B			D			D			D	
Queue Length 50th (ft)	198	185		4	498		33	8			67	304
Queue Length 95th (ft)	243	393		m9	#610		58	27			112	384
Internal Link Dist (ft)		797			234			71			396	
Turn Bay Length (ft)	200			205								220
Base Capacity (vph)	961	2664		96	1588		251	346			261	748
Starvation Cap Reductn	0	0		0	0		0	0			0	0
Spillback Cap Reductn	0	0		0	0		0	0			0	0
Storage Cap Reductn	0	0		0	0		0	0			0	0
Reduced v/c Ratio	0.66	0.57		0.06	0.80		0.20	0.08			0.38	0.76

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 30.5 Intersection LOS: C
Intersection Capacity Utilization 81.6% ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 22: VIP Dr/Connector Rd & NH 28

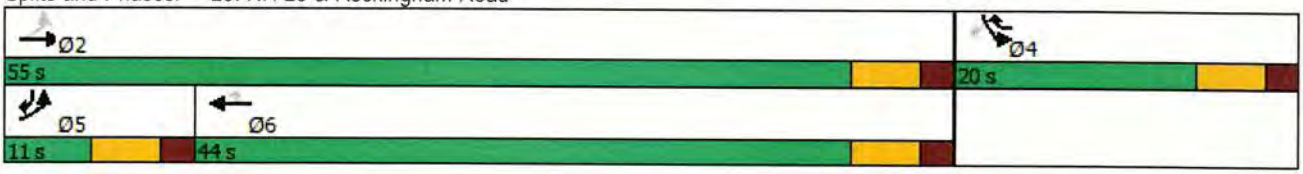
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	125	1510	1425	290	120	75
Future Volume (vph)	125	1510	1425	290	120	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			150	360	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.094				0.950	
Satd. Flow (perm)	175	3539	3539	1583	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				263		17
Link Speed (mph)		30	30		30	
Link Distance (ft)		463	580		704	
Travel Time (s)		10.5	13.2		16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	136	1641	1549	315	130	82
Shared Lane Traffic (%)						
Lane Group Flow (vph)	136	1641	1549	315	130	82
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	4	4	5
Permitted Phases	2			6		4
Detector Phase	5	2	6	4	4	5
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	20.0	20.0	20.0	20.0	11.0
Total Split (s)	11.0	55.0	44.0	20.0	20.0	11.0
Total Split (%)	14.7%	73.3%	58.7%	26.7%	26.7%	14.7%
Maximum Green (s)	5.0	49.0	38.0	14.0	14.0	5.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	44.9	44.9	36.7	54.8	10.3	21.6
Actuated g/C Ratio	0.67	0.67	0.54	0.81	0.15	0.32
v/c Ratio	0.57	0.70	0.81	0.24	0.49	0.16
Control Delay	18.0	9.2	18.2	1.0	34.3	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	9.2	18.2	1.0	34.3	15.9
LOS	B	A	B	A	C	B
Approach Delay		9.8	15.3		27.2	
Approach LOS		A	B		C	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 50th (ft)	17	185	277	4	54	21
Queue Length 95th (ft)	#77	298	#417	18	103	51
Internal Link Dist (ft)		383	500		624	
Turn Bay Length (ft)	200			150	360	
Base Capacity (vph)	237	2626	2046	1373	377	517
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.62	0.76	0.23	0.34	0.16

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 67.5
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 13.4 — Intersection LOS: B
Intersection Capacity Utilization 68.0% — ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 25: NH 28 & Rockingham Road



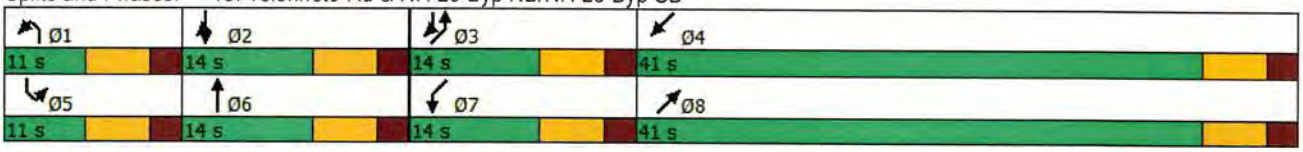
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	70	30	30	30	50	40	660	70	20	180	30
Future Volume (vph)	30	70	30	30	30	50	40	660	70	20	180	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	190		190	135		0	120		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.955				0.850		0.986			0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1779	0	1787	1881	1599	1805	1873	0	1805	1860	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1779	0	1787	1881	1599	1805	1873	0	1805	1860	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21				123		9			13	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		481			347			479			371	
Travel Time (s)		10.9			7.9			10.9			8.4	
Peak Hour Factor	0.99	0.99	0.99	0.95	0.95	0.95	0.89	0.89	0.89	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	30	71	30	32	32	53	45	742	79	22	194	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	101	0	32	32	53	45	821	0	22	226	0
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases		6			2							
Detector Phase	1	6		5	2	2 3	3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		8.0	8.0		5.0	8.0	
Minimum Split (s)	11.0	14.0		11.0	14.0		14.0	28.0		11.0	14.0	
Total Split (s)	11.0	14.0		11.0	14.0		14.0	41.0		14.0	41.0	
Total Split (%)	13.8%	17.5%		13.8%	17.5%		17.5%	51.3%		17.5%	51.3%	
Maximum Green (s)	5.0	8.0		5.0	8.0		8.0	35.0		8.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	Max		None	None		None	None	
Walk Time (s)								7.0				
Flash Dont Walk (s)								15.0				
Pedestrian Calls (#/hr)								0				
Act Effct Green (s)	5.2	8.3		5.2	8.3	22.9	8.3	34.8		6.5	31.4	
Actuated g/C Ratio	0.08	0.13		0.08	0.13	0.36	0.13	0.55		0.10	0.49	
v/c Ratio	0.21	0.40		0.22	0.13	0.08	0.19	0.80		0.12	0.24	
Control Delay	36.5	30.2		36.6	31.4	0.2	32.0	23.4		32.5	12.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	36.5	30.2		36.6	31.4	0.2	32.0	23.4		32.5	12.3	
LOS	D	C		D	C	A	C	C		C	B	
Approach Delay		31.6			18.7			23.9			14.1	
Approach LOS		C			B			C			B	
Queue Length 50th (ft)	9	24		10	9	0	13	140		7	47	
Queue Length 95th (ft)	41	86		43	41	0	52	#636		32	113	
Internal Link Dist (ft)		401			267			399			291	
Turn Bay Length (ft)	200			190		190	135			120		
Base Capacity (vph)	145	251		146	247	655	236	1079		236	1074	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.21	0.40		0.22	0.13	0.08	0.19	0.76		0.09	0.21	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 63.5
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 22.4 Intersection LOS: C
Intersection Capacity Utilization 57.3% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: Tsienneto Rd & NH 28 Byp NB/NH 28 Byp SB



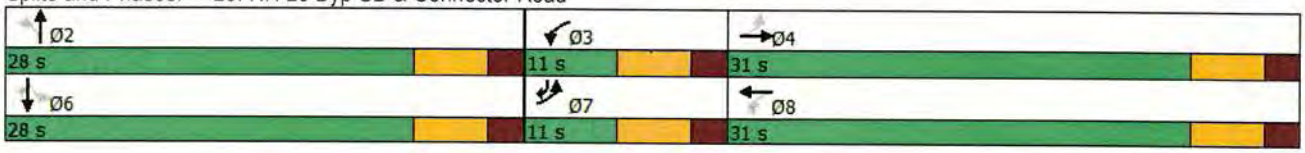
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	460	5	10	490	10	5	60	10	10	60	70
Future Volume (vph)	60	460	5	10	490	10	5	60	10	10	60	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275		0	75		100	75		0	210		210
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.997			0.978				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1861	0	1770	1857	0	1770	1822	0	1770	1863	1583
Flt Permitted	0.223			0.356			0.715			0.708		
Satd. Flow (perm)	415	1861	0	663	1857	0	1332	1822	0	1319	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			2			11				76
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		310			410			481			432	
Travel Time (s)		7.0			9.3			10.9			9.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	500	5	11	533	11	5	65	11	11	65	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	65	505	0	11	544	0	5	76	0	11	65	76
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		3	8		2	2		6	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	11.0	28.0		11.0	28.0		28.0	28.0		28.0	28.0	11.0
Total Split (s)	11.0	31.0		11.0	31.0		28.0	28.0		28.0	28.0	11.0
Total Split (%)	15.7%	44.3%		15.7%	44.3%		40.0%	40.0%		40.0%	40.0%	15.7%
Maximum Green (s)	5.0	25.0		5.0	25.0		22.0	22.0		22.0	22.0	5.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Max		None	None		Max	Max		None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		15.0			15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	31.9	30.9		28.4	24.5		22.1	22.1		22.1	22.1	33.1
Actuated g/C Ratio	0.47	0.46		0.42	0.36		0.33	0.33		0.33	0.33	0.49
v/c Ratio	0.22	0.59		0.03	0.80		0.01	0.13		0.03	0.11	0.09
Control Delay	10.6	18.3		8.8	31.2		16.8	15.8		17.0	17.6	3.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	10.6	18.3		8.8	31.2		16.8	15.8		17.0	17.6	3.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	B		A	C		B	B		B	B	A
Approach Delay		17.4			30.8			15.8			10.4	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)	13	135		2	208		2	20		3	20	0
Queue Length 95th (ft)	31	#331		9	#373		8	48		14	46	19
Internal Link Dist (ft)		230			330			401			352	
Turn Bay Length (ft)	275			75			75			210		210
Base Capacity (vph)	298	857		362	695		437	606		433	612	819
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.22	0.59		0.03	0.78		0.01	0.13		0.03	0.11	0.09

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 67.2
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 22.0 — Intersection LOS: C
Intersection Capacity Utilization 52.8% — ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 23: NH 28 Byp SB & Connector Road



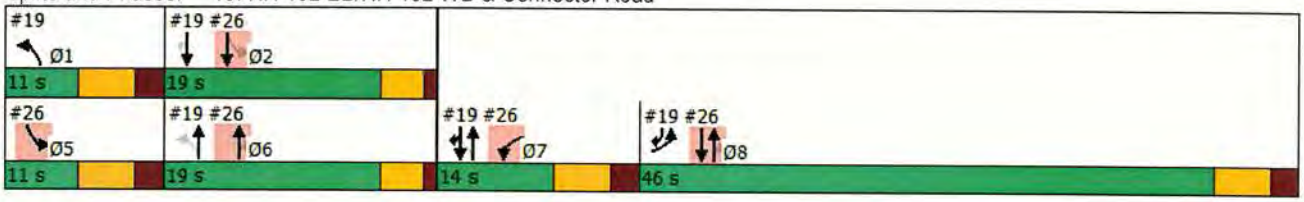
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø2	Ø5	Ø6	Ø7
Lane Configurations										
Traffic Volume (vph)	700	10	40	130	130	650				
Future Volume (vph)	700	10	40	130	130	650				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	0	0	120			90				
Storage Lanes	1	0	1			1				
Taper Length (ft)	25		25							
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Frt	0.998					0.850				
Flt Protected	0.953		0.950							
Satd. Flow (prot)	1772	0	1626	1712	1863	1583				
Flt Permitted	0.953		0.596							
Satd. Flow (perm)	1772	0	1020	1712	1863	1583				
Right Turn on Red		Yes				Yes				
Satd. Flow (RTOR)	1					793				
Link Speed (mph)	30			30	30					
Link Distance (ft)	475			739	258					
Travel Time (s)	10.8			16.8	5.9					
Peak Hour Factor	0.94	0.94	0.91	0.91	0.82	0.82				
Heavy Vehicles (%)	2%	2%	11%	11%	2%	2%				
Adj. Flow (vph)	745	11	44	143	159	793				
Shared Lane Traffic (%)										
Lane Group Flow (vph)	756	0	44	143	159	793				
Turn Type	Prot		pm+pt	NA	NA	custom				
Protected Phases	8		1	6 7	2 7	7 8	2	5	6	7
Permitted Phases			6 7			2				
Detector Phase	8		1	6 7	2 7	7 8				
Switch Phase										
Minimum Initial (s)	5.0		5.0				5.0	5.0	5.0	5.0
Minimum Split (s)	26.5		11.0				9.0	11.0	9.0	11.0
Total Split (s)	46.0		11.0				19.0	11.0	19.0	14.0
Total Split (%)	51.1%		12.2%				21%	12%	21%	16%
Maximum Green (s)	40.0		5.0				15.0	5.0	15.0	8.0
Yellow Time (s)	4.0		4.0				3.0	4.0	3.0	4.0
All-Red Time (s)	2.0		2.0				1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0		0.0							
Total Lost Time (s)	6.0		6.0							
Lead/Lag	Lag		Lead				Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes		Yes				Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0		3.0				3.0	3.0	3.0	3.0
Recall Mode	None		None				Min	None	Min	None
Act Effct Green (s)	40.4		27.7	26.9	26.9	74.0				
Actuated g/C Ratio	0.48		0.33	0.32	0.32	0.89				
v/c Ratio	0.88		0.12	0.26	0.27	0.53				
Control Delay	35.7		16.8	23.4	24.4	1.5				
Queue Delay	0.0		0.0	0.0	1.3	0.4				
Total Delay	35.7		16.8	23.4	25.7	1.9				
LOS	D		B	C	C	A				
Approach Delay	35.7			21.8	5.9					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø2	Ø5	Ø6	Ø7
Approach LOS	D			C	A					
Queue Length 50th (ft)	403		14	60	62	5				
Queue Length 95th (ft)	#654		35	107	98	0				
Internal Link Dist (ft)	395			659	178					
Turn Bay Length (ft)			120			90				
Base Capacity (vph)	857		374	548	597	1480				
Starvation Cap Reductn	0		0	0	276	260				
Spillback Cap Reductn	0		0	0	0	0				
Storage Cap Reductn	0		0	0	0	0				
Reduced v/c Ratio	0.88		0.12	0.26	0.50	0.65				

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 83.5
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 19.4 — Intersection LOS: B
Intersection Capacity Utilization 63.7% — ICU Level of Service B
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 19: NH 102 EB/NH 102 WB & Connector Road



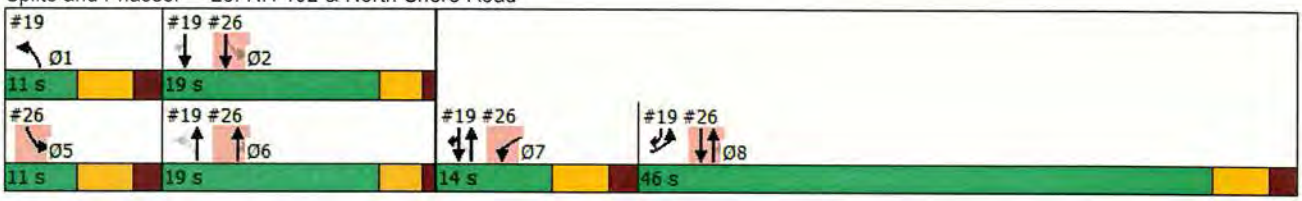
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø1	Ø2	Ø6	Ø8
Lane Configurations										
Traffic Volume (vph)	70	10	680	150	30	710				
Future Volume (vph)	70	10	680	150	30	710				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	0	0		90	100					
Storage Lanes	1	0		1	1					
Taper Length (ft)	25				25					
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Frt	0.979			0.850						
Flt Protected	0.960				0.950					
Satd. Flow (prot)	1771	0	1900	1615	1805	1900				
Flt Permitted	0.960				0.312					
Satd. Flow (perm)	1771	0	1900	1615	593	1900				
Right Turn on Red		Yes		Yes						
Satd. Flow (RTOR)	8			125						
Link Speed (mph)	30		30			30				
Link Distance (ft)	524		258			288				
Travel Time (s)	11.9		5.9			6.5				
Peak Hour Factor	0.87	0.67	0.95	0.84	0.73	0.96				
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%				
Adj. Flow (vph)	80	15	716	179	41	740				
Shared Lane Traffic (%)										
Lane Group Flow (vph)	95	0	716	179	41	740				
Turn Type	Prot		NA	Perm	custom	NA				
Protected Phases	7		6 8		5	2 8	1	2	6	8
Permitted Phases				6 8	2					
Detector Phase	7		6 8	6 8	5	2 8				
Switch Phase										
Minimum Initial (s)	5.0				5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	11.0				11.0		11.0	9.0	9.0	26.5
Total Split (s)	14.0				11.0		11.0	19.0	19.0	46.0
Total Split (%)	15.6%				12.2%		12%	21%	21%	51%
Maximum Green (s)	8.0				5.0		5.0	15.0	15.0	40.0
Yellow Time (s)	4.0				4.0		4.0	3.0	3.0	4.0
All-Red Time (s)	2.0				2.0		2.0	1.0	1.0	2.0
Lost Time Adjust (s)	0.0				0.0					
Total Lost Time (s)	6.0				6.0					
Lead/Lag	Lead				Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes				Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0				3.0		3.0	3.0	3.0	3.0
Recall Mode	None				None		None	Min	Min	None
Act Effct Green (s)	8.1		57.0	57.0	13.6	57.0				
Actuated g/C Ratio	0.10		0.68	0.68	0.16	0.68				
v/c Ratio	0.54		0.55	0.16	0.24	0.57				
Control Delay	47.4		2.1	0.5	29.1	6.7				
Queue Delay	0.0		0.3	0.1	0.0	0.0				
Total Delay	47.4		2.4	0.6	29.1	6.7				
LOS	D		A	A	C	A				
Approach Delay	47.4		2.1			7.9				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø1	Ø2	Ø6	Ø8
Approach LOS	D		A			A				
Queue Length 50th (ft)	48		22	0	18	101				
Queue Length 95th (ft)	#102		m42	m1	34	149				
Internal Link Dist (ft)	444		178			208				
Turn Bay Length (ft)				90	100					
Base Capacity (vph)	178		1350	1184	169	1350				
Starvation Cap Reductn	0		180	377	0	0				
Spillback Cap Reductn	0		0	0	0	0				
Storage Cap Reductn	0		0	0	0	0				
Reduced v/c Ratio	0.53		0.61	0.22	0.24	0.55				

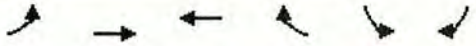
Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 83.5
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 7.0 Intersection LOS: A
Intersection Capacity Utilization 50.2% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 26: NH 102 & North Shore Road



APPENDIX R-1: ALTERNATIVE D INTERSECTION CAPACITY ANALYSES – HCS PRINTOUTS – AM PEAK HOUR



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1365	805	0	115	985
Future Volume (vph)	0	1365	805	0	115	985
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		0.95	0.95		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3406		1930	2682
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3406		1930	2682
Peak-hour factor, PHF	0.93	0.93	0.88	0.88	0.89	0.89
Adj. Flow (vph)	0	1468	915	0	129	1107
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1468	915	0	129	1107
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		32.0	32.0		31.0	31.0
Effective Green, g (s)		32.0	32.0		31.0	31.0
Actuated g/C Ratio		0.43	0.43		0.41	0.41
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1480	1453		797	1108
v/s Ratio Prot		c0.42	0.27		0.07	c0.41
v/s Ratio Perm						
v/c Ratio		0.99	0.63		0.16	1.00
Uniform Delay, d1		21.4	16.9		13.8	22.0
Progression Factor		0.99	1.32		1.00	1.00
Incremental Delay, d2		13.3	0.2		0.1	26.6
Delay (s)		34.6	22.4		13.9	48.6
Level of Service		C	C		B	D
Approach Delay (s)		34.6	22.4		45.0	
Approach LOS		C	C		D	

Intersection Summary			
HCM 2000 Control Delay	35.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	455	0	330	0	0	1310	170	0	0	1080	360
Future Volume (vph)	455	0	330	0	0	1310	170	0	0	1080	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0	6.0			6.0	4.0
Lane Util. Factor	0.97		0.88			0.97	0.95			0.95	1.00
Frt	1.00		0.85			1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)	3242		2632			3335	3438			3505	1568
Flt Permitted	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (perm)	3242		2632			3335	3438			3505	1568
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	517	0	375	0	0	1394	181	0	0	1174	391
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	517	0	375	0	0	1394	181	0	0	1174	391
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Actuated Green, G (s)	23.0		23.0			60.0	115.0			49.0	150.0
Effective Green, g (s)	23.0		23.0			60.0	115.0			49.0	150.0
Actuated g/C Ratio	0.15		0.15			0.40	0.77			0.33	1.00
Clearance Time (s)	6.0		6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	497		403			1334	2635			1144	1568
v/s Ratio Prot	c0.16		0.14			c0.42	0.05			c0.33	
v/s Ratio Perm											0.25
v/c Ratio	1.04		0.93			1.04	0.07			1.03	0.25
Uniform Delay, d1	63.5		62.7			45.0	4.3			50.5	0.0
Progression Factor	1.00		1.00			0.61	1.73			1.00	1.00
Incremental Delay, d2	51.2		28.0			28.7	0.0			33.5	0.4
Delay (s)	114.7		90.7			56.0	7.5			84.0	0.4
Level of Service	F		F			E	A			F	A
Approach Delay (s)		104.6		0.0			50.5			63.1	
Approach LOS		F		A			D			E	

Intersection Summary			
HCM 2000 Control Delay	67.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	96.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	585	460	285	685	0	0	0	0	110	0	360
Future Volume (vph)	0	585	460	285	685	0	0	0	0	110	0	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3167	1417	1687	3374					3303		1524
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3167	1417	1687	3374					3303		1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.73	0.73	0.73	0.92	0.92	0.92	0.74	0.74	0.74
Adj. Flow (vph)	0	636	500	390	938	0	0	0	0	149	0	486
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	96
Lane Group Flow (vph)	0	636	500	390	938	0	0	0	0	149	0	390
Heavy Vehicles (%)	14%	14%	14%	7%	7%	7%	2%	2%	2%	6%	6%	6%
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Actuated Green, G (s)		32.1	110.0	28.8	66.9					31.1		31.1
Effective Green, g (s)		32.1	110.0	28.8	66.9					31.1		31.1
Actuated g/C Ratio		0.29	1.00	0.26	0.61					0.28		0.28
Clearance Time (s)		6.0		6.0	6.0					6.0		6.0
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Lane Grp Cap (vph)		924	1417	441	2052					933		430
v/s Ratio Prot		c0.20		c0.23	0.28					0.05		c0.26
v/s Ratio Perm			0.35									
v/c Ratio		0.69	0.35	0.88	0.46					0.16		0.91
Uniform Delay, d1		34.5	0.0	39.0	11.7					29.6		38.1
Progression Factor		1.00	1.00	0.40	0.08					1.00		1.00
Incremental Delay, d2		4.2	0.7	16.0	0.4					0.1		22.3
Delay (s)		38.7	0.7	31.4	1.3					29.7		60.4
Level of Service		D	A	C	A					C		E
Approach Delay (s)		22.0			10.1			0.0			53.2	
Approach LOS		C			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	485	210	0	0	520	350	450	0	160	0	0	0
Future Volume (vph)	485	210	0	0	520	350	450	0	160	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1641	3282			3438	1538	1656		1482			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1641	3282			3438	1538	1656		1482			
Peak-hour factor, PHF	0.87	0.87	0.87	0.90	0.90	0.90	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	557	241	0	0	578	389	577	0	205	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	128	0	0	0
Lane Group Flow (vph)	557	241	0	0	578	389	577	0	77	0	0	0
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	9%	9%	9%	2%	2%	2%
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Actuated Green, G (s)	36.0	61.0			19.0	110.0	37.0		37.0			
Effective Green, g (s)	36.0	61.0			19.0	110.0	37.0		37.0			
Actuated g/C Ratio	0.33	0.55			0.17	1.00	0.34		0.34			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Lane Grp Cap (vph)	537	1820			593	1538	557		498			
v/s Ratio Prot	c0.34	0.07			c0.17		c0.35		0.05			
v/s Ratio Perm						0.25						
v/c Ratio	1.04	0.13			0.97	0.25	1.04		0.15			
Uniform Delay, d1	37.0	11.8			45.3	0.0	36.5		25.6			
Progression Factor	0.27	0.17			1.00	1.00	1.00		1.00			
Incremental Delay, d2	43.7	0.1			31.2	0.4	47.7		0.1			
Delay (s)	53.5	2.1			76.5	0.4	84.2		25.7			
Level of Service	D	A			E	A	F		C			
Approach Delay (s)		38.0			45.9			68.9			0.0	
Approach LOS		D			D			E			A	

Intersection Summary			
HCM 2000 Control Delay	50.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	0	160	0	0	1	100	500	5	5	1110	30
Future Volume (vph)	10	0	160	0	0	1	100	500	5	5	1110	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.86		1.00	1.00		1.00	1.00	
Flt Protected		0.95	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1770	1583		1644		1770	3534		1770	3525	
Flt Permitted		1.00	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1863	1583		1644		1770	3534		1770	3525	
Peak-hour factor, PHF	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	0	174	0	0	4	109	543	5	5	1207	33
RTOR Reduction (vph)	0	0	65	0	4	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	11	109	0	0	0	109	547	0	5	1238	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	custom		NA		Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Actuated Green, G (s)		1.2	44.8		1.2		7.8	51.8		0.8	44.8	
Effective Green, g (s)		1.2	44.8		1.2		7.8	51.8		0.8	44.8	
Actuated g/C Ratio		0.02	0.62		0.02		0.11	0.72		0.01	0.62	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		31	987		27		192	2549		19	2199	
v/s Ratio Prot					0.00		c0.06	0.15		0.00	c0.35	
v/s Ratio Perm		c0.01	0.07									
v/c Ratio		0.35	0.11		0.00		0.57	0.21		0.26	0.56	
Uniform Delay, d1		34.9	5.5		34.7		30.4	3.3		35.2	7.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.9	0.0		0.0		3.8	0.0		7.3	0.3	
Delay (s)		41.8	5.5		34.7		34.2	3.3		42.5	8.2	
Level of Service		D	A		C		C	A		D	A	
Approach Delay (s)		7.7			34.7			8.5			8.3	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	71.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	20	10	350	0	30	0	420	110	15	585	0
Future Volume (vph)	10	20	10	350	0	30	0	420	110	15	585	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.99			0.97			1.00	
Flt Protected		0.99			0.96			1.00			1.00	
Satd. Flow (prot)		1776			1745			1710			1807	
Flt Permitted		0.87			0.69			1.00			0.98	
Satd. Flow (perm)		1573			1268			1710			1776	
Peak-hour factor, PHF	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	17	33	17	365	0	31	0	472	124	17	680	0
RTOR Reduction (vph)	0	11	0	0	23	0	0	11	0	0	0	0
Lane Group Flow (vph)	0	56	0	0	373	0	0	585	0	0	697	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Actuated Green, G (s)		27.3			27.3			38.4			38.4	
Effective Green, g (s)		27.3			27.3			38.4			38.4	
Actuated g/C Ratio		0.35			0.35			0.49			0.49	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		552			445			845			877	
v/s Ratio Prot								0.34				
v/s Ratio Perm		0.04			c0.29						c0.39	
v/c Ratio		0.10			0.84			0.69			0.79	
Uniform Delay, d1		16.9			23.2			15.1			16.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			12.9			2.5			5.0	
Delay (s)		17.0			36.1			17.6			21.4	
Level of Service		B			D			B			C	
Approach Delay (s)		17.0			36.1			17.6			21.4	
Approach LOS		B			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	77.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	200	90	20	520	60	60	290	30	70	240	30
Future Volume (vph)	80	200	90	20	520	60	60	290	30	70	240	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1656	1662		1703	1765		1719	1784		1703	1792	1524
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1656	1662		1703	1765		1719	1784		1703	1792	1524
Peak-hour factor, PHF	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.91	0.91	0.91
Adj. Flow (vph)	83	208	94	21	553	64	71	341	35	77	264	33
RTOR Reduction (vph)	0	17	0	0	4	0	0	4	0	0	0	26
Lane Group Flow (vph)	83	285	0	21	613	0	71	372	0	77	264	7
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	5%	5%	5%	6%	6%	6%
Parking (#/hr)			0									
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	4.6	36.0		2.3	33.7		7.4	19.2		7.5	19.3	19.3
Effective Green, g (s)	4.6	36.0		2.3	33.7		7.4	19.2		7.5	19.3	19.3
Actuated g/C Ratio	0.05	0.40		0.03	0.38		0.08	0.22		0.08	0.22	0.22
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	85	672		44	668		142	384		143	388	330
v/s Ratio Prot	c0.05	0.17		0.01	c0.35		0.04	c0.21		c0.05	0.15	
v/s Ratio Perm												0.00
v/c Ratio	0.98	0.42		0.48	0.92		0.50	0.97		0.54	0.68	0.02
Uniform Delay, d1	42.1	19.0		42.8	26.3		39.0	34.6		39.1	32.0	27.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	89.0	0.4		7.9	17.4		2.8	37.3		3.9	4.9	0.0
Delay (s)	131.1	19.5		50.7	43.7		41.8	71.9		43.0	36.9	27.4
Level of Service	F	B		D	D		D	E		D	D	C
Approach Delay (s)		43.5			44.0			67.1			37.3	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	48.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	370	20	5	100	80	270
Future Volume (vph)	370	20	5	100	80	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	120	0			220
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.998		
Satd. Flow (prot)	1719	1538	0	1823	1863	1583
Flt Permitted	0.950			0.998		
Satd. Flow (perm)	1719	1538	0	1823	1863	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	322			309	292	
Travel Time (s)	7.3			7.0	6.6	
Peak Hour Factor	0.89	0.89	0.91	0.91	0.93	0.93
Heavy Vehicles (%)	5%	5%	4%	4%	2%	2%
Adj. Flow (vph)	416	22	5	110	86	290
Shared Lane Traffic (%)						
Lane Group Flow (vph)	416	22	0	115	86	290
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 36.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	17.9
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	370	20	5	100	80	270
Future Vol, veh/h	370	20	5	100	80	270
Peak Hour Factor	0.89	0.89	0.91	0.91	0.93	0.93
Heavy Vehicles, %	5	5	4	4	2	2
Mvmt Flow	416	22	5	110	86	290
Number of Lanes	1	1	0	1	1	1

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	2
HCM Control Delay	24.8	11.2	12
HCM LOS	C	B	B

Lane	NBLn1	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	5%	100%	0%	0%	0%
Vol Thru, %	95%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	105	370	20	80	270
LT Vol	5	370	0	0	0
Through Vol	100	0	0	80	0
RT Vol	0	0	20	0	270
Lane Flow Rate	115	416	22	86	290
Geometry Grp	4	7	7	7	7
Degree of Util (X)	0.206	0.745	0.033	0.148	0.443
Departure Headway (Hd)	6.428	6.453	5.242	6.209	5.499
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	557	561	683	577	653
Service Time	4.479	4.182	2.97	3.953	3.242
HCM Lane V/C Ratio	0.206	0.742	0.032	0.149	0.444
HCM Control Delay	11.2	25.7	8.1	10	12.6
HCM Lane LOS	B	D	A	A	B
HCM 95th-tile Q	0.8	6.4	0.1	0.5	2.3

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	0	0	470	350	20
Future Volume (vph)	10	0	0	470	350	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.993	
Flt Protected	0.950					
Satd. Flow (prot)	1008	0	0	1827	1780	0
Flt Permitted	0.950					
Satd. Flow (perm)	1008	0	0	1827	1780	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	160			224	319	
Travel Time (s)	3.6			5.1	7.3	
Peak Hour Factor	0.44	0.44	0.95	0.95	0.96	0.96
Heavy Vehicles (%)	79%	79%	4%	4%	6%	6%
Adj. Flow (vph)	23	0	0	495	365	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	0	0	495	386	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 34.7%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	0	0	470	350	20
Future Vol, veh/h	10	0	0	470	350	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	44	44	95	95	96	96
Heavy Vehicles, %	79	79	4	4	6	6
Mvmt Flow	23	0	0	495	365	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	871	376	386	0	-	0
Stage 1	376	-	-	-	-	-
Stage 2	495	-	-	-	-	-
Critical Hdwy	7.19	6.99	4.14	-	-	-
Critical Hdwy Stg 1	6.19	-	-	-	-	-
Critical Hdwy Stg 2	6.19	-	-	-	-	-
Follow-up Hdwy	4.211	4.011	2.236	-	-	-
Pot Cap-1 Maneuver	239	529	1162	-	-	-
Stage 1	554	-	-	-	-	-
Stage 2	481	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	239	529	1162	-	-	-
Mov Cap-2 Maneuver	239	-	-	-	-	-
Stage 1	554	-	-	-	-	-
Stage 2	481	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1162	-	239	-	-
HCM Lane V/C Ratio	-	-	0.095	-	-
HCM Control Delay (s)	0	-	21.6	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	50	410	10	30	280	10	20	10	80	10	0	30
Future Volume (vph)	50	410	10	30	280	10	20	10	80	10	0	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	0		0	150		150
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.996			0.902			0.899	
Flt Protected		0.995			0.995			0.991			0.988	
Satd. Flow (prot)	0	1762	0	0	1793	0	0	1665	0	0	1688	0
Flt Permitted		0.995			0.995			0.991			0.988	
Satd. Flow (perm)	0	1762	0	0	1793	0	0	1665	0	0	1688	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		327			240			246			251	
Travel Time (s)		7.4			5.5			5.6			5.7	
Peak Hour Factor	0.89	0.89	0.89	0.96	0.96	0.96	0.65	0.65	0.65	0.67	0.67	0.67
Heavy Vehicles (%)	7%	7%	7%	5%	5%	5%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	56	461	11	31	292	10	31	15	123	15	0	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	528	0	0	333	0	0	169	0	0	60	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	50	410	10	30	280	10	20	10	80	10	0	30
Future Vol, veh/h	50	410	10	30	280	10	20	10	80	10	0	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	96	96	96	65	65	65	67	67	67
Heavy Vehicles, %	7	7	7	5	5	5	2	2	2	0	0	0
Mvmt Flow	56	461	11	31	292	10	31	15	123	15	0	45

Major/Minor	Major1			Major2			Minor2			Minor1		
Conflicting Flow All	302	0	0	472	0	0	960	943	297	946	943	467
Stage 1	-	-	-	-	-	-	359	359	-	579	579	-
Stage 2	-	-	-	-	-	-	601	584	-	367	364	-
Critical Hdwy	4.17	-	-	4.15	-	-	7.12	6.52	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Follow-up Hdwy	2.263	-	-	2.245	-	-	3.518	4.018	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	1231	-	-	1074	-	-	236	263	742	243	265	600
Stage 1	-	-	-	-	-	-	659	627	-	504	504	-
Stage 2	-	-	-	-	-	-	487	498	-	657	627	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1231	-	-	1074	-	-	202	238	742	179	240	600
Mov Cap-2 Maneuver	-	-	-	-	-	-	202	238	-	179	240	-
Stage 1	-	-	-	-	-	-	618	605	-	473	473	-
Stage 2	-	-	-	-	-	-	423	467	-	515	605	-

Approach	EB	WB	SE	NW
HCM Control Delay, s	0.9	0.8	10.9	16.3
HCM LOS			B	C

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	WBL	WBT	WBR	SELn1
Capacity (veh/h)	378	1231	-	-	1074	-	-	780
HCM Lane V/C Ratio	0.158	0.046	-	-	0.029	-	-	0.217
HCM Control Delay (s)	16.3	8.1	0	-	8.5	0	-	10.9
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0.1	-	-	0.1	-	-	0.8

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	200	140	590	190	0	160	220	30	30	310	770
Future Volume (vph)	20	200	140	590	190	0	160	220	30	30	310	770
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.97	1.00	1.00	1.00	1.00	0.88
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	3471	1553	3335	3438		3400	1845	1568	1752	1845	2760
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1736	3471	1553	3335	3438		3400	1845	1568	1752	1845	2760
Peak-hour factor, PHF	0.84	0.84	0.84	0.79	0.79	0.79	0.86	0.86	0.86	0.99	0.99	0.99
Adj. Flow (vph)	24	238	167	747	241	0	186	256	35	30	313	778
RTOR Reduction (vph)	0	0	125	0	0	0	0	0	0	0	0	124
Lane Group Flow (vph)	24	238	42	747	241	0	186	256	35	30	313	654
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	1	6	7	5	2		3	8		7	4	4 5
Permitted Phases		6	6		2			8	Free		4	
Actuated Green, G (s)	12.7	15.1	22.6	22.9	25.3		7.0	20.5	90.0	7.5	21.0	43.9
Effective Green, g (s)	12.7	15.1	22.6	22.9	25.3		7.0	20.5	90.0	7.5	21.0	43.9
Actuated g/C Ratio	0.14	0.17	0.25	0.25	0.28		0.08	0.23	1.00	0.08	0.23	0.49
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	244	582	493	848	966		264	420	1568	146	430	1346
v/s Ratio Prot	0.01	c0.07	0.01	c0.22	0.07		0.05	c0.14		0.02	c0.17	0.24
v/s Ratio Perm			0.02						c0.02			
v/c Ratio	0.10	0.41	0.09	0.88	0.25		0.70	0.61	0.02	0.21	0.73	0.49
Uniform Delay, d1	33.7	33.5	25.8	32.2	25.0		40.5	31.2	0.0	38.5	31.9	15.5
Progression Factor	1.00	1.00	1.00	0.90	0.89		1.00	1.00	1.00	0.72	0.64	0.58
Incremental Delay, d2	0.2	0.5	0.1	10.1	0.6		8.3	2.5	0.0	0.5	4.5	0.2
Delay (s)	33.8	33.9	25.9	39.2	22.8		48.8	33.7	0.0	28.4	24.8	9.2
Level of Service	C	C	C	D	C		D	C	A	C	C	A
Approach Delay (s)		30.8			35.2			37.1			14.1	
Approach LOS		C			D			D			B	

Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	300	70	580	370	60	810
Future Volume (vph)	300	70	580	370	60	810
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	4.0	6.0	6.0
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	3505	1568	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.23	1.00
Satd. Flow (perm)	1770	1583	3505	1568	429	3539
Peak-hour factor, PHF	0.83	0.83	0.86	0.86	0.81	0.81
Adj. Flow (vph)	361	84	674	430	74	1000
RTOR Reduction (vph)	0	10	0	0	0	0
Lane Group Flow (vph)	361	74	674	430	74	1000
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Turn Type	Prot	pm+ov	NA	Free	pm+pt	NA
Protected Phases	1 2 5 6	7	8		7	3 4
Permitted Phases		1 2 5 6		Free	3 4	
Actuated Green, G (s)	40.4	47.9	20.5	90.0	34.0	34.0
Effective Green, g (s)	40.4	47.9	20.5	90.0	34.0	34.0
Actuated g/C Ratio	0.45	0.53	0.23	1.00	0.38	0.38
Clearance Time (s)		6.0	6.0		6.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)	794	948	798	1568	273	1336
v/s Ratio Prot	c0.20	0.01	c0.19		0.02	c0.28
v/s Ratio Perm		0.04		c0.27	0.08	
v/c Ratio	0.45	0.08	0.84	0.27	0.27	0.75
Uniform Delay, d1	17.2	10.3	33.2	0.0	27.8	24.3
Progression Factor	1.00	1.00	0.58	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.0	5.6	0.3	0.5	2.3
Delay (s)	17.6	10.3	24.7	0.3	28.3	26.6
Level of Service	B	B	C	A	C	C
Approach Delay (s)	16.2		15.2			26.7
Approach LOS	B		B			C

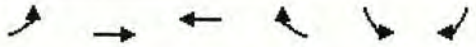
Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	160	980	0	0	980	50	5	0	5	20	0	180
Future Volume (vph)	160	980	0	0	980	50	5	0	5	20	0	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00			0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00			1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1687	3374			3514			1805	1615		1787	1599
Flt Permitted	0.95	1.00			1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	1687	3374			3514			1900	1615		1881	1599
Peak-hour factor, PHF	0.83	0.83	0.83	0.92	0.92	0.92	0.50	0.50	0.50	0.90	0.90	0.90
Adj. Flow (vph)	193	1181	0	0	1065	54	10	0	10	22	0	200
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	10	0	0	82
Lane Group Flow (vph)	193	1181	0	0	1116	0	0	10	0	0	22	118
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases					6		8	8	8	4		4
Actuated Green, G (s)	18.9	74.6			49.7			3.4	3.4		3.4	22.3
Effective Green, g (s)	18.9	74.6			49.7			3.4	3.4		3.4	22.3
Actuated g/C Ratio	0.21	0.83			0.55			0.04	0.04		0.04	0.25
Clearance Time (s)	6.0	6.0			6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	354	2796			1940			71	61		71	502
v/s Ratio Prot	c0.11	0.35			c0.32							c0.05
v/s Ratio Perm								0.01	0.00		0.01	0.02
v/c Ratio	0.55	0.42			0.58			0.14	0.01		0.31	0.24
Uniform Delay, d1	31.7	2.0			13.2			41.9	41.7		42.2	27.0
Progression Factor	0.97	1.99			1.46			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.5	0.4			0.4			0.9	0.0		2.5	0.2
Delay (s)	32.2	4.4			19.7			42.8	41.7		44.6	27.3
Level of Service	C	A			B			D	D		D	C
Approach Delay (s)		8.3			19.7			42.3			29.0	
Approach LOS		A			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	990	20	5	940	340	10	5	5	110	5	180
Future Volume (vph)	140	990	20	5	940	340	10	5	5	110	5	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	3303	3396		1736	3471	1553	1805	1758		1665	1676	1568
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.00	1.00
Satd. Flow (perm)	3303	3396		1736	3471	1553	1805	1758		1665	0	1568
Peak-hour factor, PHF	0.83	0.83	0.83	0.97	0.97	0.97	0.67	0.67	0.67	0.90	0.90	0.90
Adj. Flow (vph)	169	1193	24	5	969	351	15	7	7	122	6	200
RTOR Reduction (vph)	0	1	0	0	0	133	0	7	0	0	0	135
Lane Group Flow (vph)	169	1216	0	5	969	218	15	7	0	63	65	65
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	pt+ov
Protected Phases	5	2		1	6	7	3	8		7	4	4 5
Permitted Phases						6		8				
Actuated Green, G (s)	9.2	55.4		1.0	47.2	55.8	1.5	1.0		8.6	8.6	23.3
Effective Green, g (s)	9.2	55.4		1.0	47.2	55.8	1.5	1.0		8.6	8.6	23.3
Actuated g/C Ratio	0.10	0.62		0.01	0.52	0.62	0.02	0.01		0.10	0.10	0.26
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	337	2090		19	1820	962	30	19		159	160	405
v/s Ratio Prot	0.05	c0.36		0.00	c0.28	0.02	c0.01	0.00		0.04	c0.04	0.04
v/s Ratio Perm						0.12						
v/c Ratio	0.50	0.58		0.26	0.53	0.23	0.50	0.37		0.40	0.41	0.16
Uniform Delay, d1	38.2	10.4		44.1	14.1	7.6	43.9	44.2		38.3	38.3	25.8
Progression Factor	1.00	1.00		1.08	0.90	7.08	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.2	1.2		6.5	0.3	0.1	12.5	11.9		1.6	1.7	0.2
Delay (s)	39.4	11.6		54.0	12.9	53.6	56.4	56.1		39.9	40.0	26.0
Level of Service	D	B		D	B	D	E	E		D	D	C
Approach Delay (s)		14.9			23.9			56.2			31.4	
Approach LOS		B			C			E			C	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	120	1340	1180	10	20	100
Future Volume (vph)	120	1340	1180	10	20	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			0	175	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.999			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1687	3374	3468	0	1703	1524
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1687	3374	3468	0	1703	1524
Link Speed (mph)		30	30		30	
Link Distance (ft)		535	210		522	
Travel Time (s)		12.2	4.8		11.9	
Peak Hour Factor	0.84	0.84	0.89	0.89	0.83	0.83
Heavy Vehicles (%)	7%	7%	4%	4%	6%	6%
Adj. Flow (vph)	143	1595	1326	11	24	120
Shared Lane Traffic (%)						
Lane Group Flow (vph)	143	1595	1337	0	24	120
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 52.9%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	120	1340	1180	10	20	100
Future Vol, veh/h	120	1340	1180	10	20	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	-	175	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	89	89	83	83
Heavy Vehicles, %	7	7	4	4	6	6
Mvmt Flow	143	1595	1326	11	24	120

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1337	0	-	0	2416	669
Stage 1	-	-	-	-	1332	-
Stage 2	-	-	-	-	1084	-
Critical Hdwy	4.24	-	-	-	6.92	7.02
Critical Hdwy Stg 1	-	-	-	-	5.92	-
Critical Hdwy Stg 2	-	-	-	-	5.92	-
Follow-up Hdwy	2.27	-	-	-	3.56	3.36
Pot Cap-1 Maneuver	486	-	-	-	26	391
Stage 1	-	-	-	-	204	-
Stage 2	-	-	-	-	277	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	486	-	-	-	~ 18	391
Mov Cap-2 Maneuver	-	-	-	-	~ 18	-
Stage 1	-	-	-	-	144	-
Stage 2	-	-	-	-	277	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	121.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	486	-	-	-	18	391
HCM Lane V/C Ratio	0.294	-	-	-	1.339	0.308
HCM Control Delay (s)	15.5	-	-	-	$ 636.6	18.3
HCM Lane LOS	C	-	-	-	F	C
HCM 95th %tile Q(veh)	1.2	-	-	-	3.4	1.3

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	55	1630	1560	210	90	105
Future Volume (vph)	55	1630	1560	210	90	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3476		1770	1583
Flt Permitted	0.10	1.00	1.00		0.95	1.00
Satd. Flow (perm)	184	3539	3476		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	1772	1696	228	98	114
RTOR Reduction (vph)	0	0	16	0	0	16
Lane Group Flow (vph)	60	1772	1908	0	98	98
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Actuated Green, G (s)	41.9	41.9	34.4		4.4	5.9
Effective Green, g (s)	41.9	41.9	34.4		4.4	5.9
Actuated g/C Ratio	0.72	0.72	0.59		0.08	0.10
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	173	2543	2051		133	323
v/s Ratio Prot	0.01	c0.50	c0.55		c0.06	0.01
v/s Ratio Perm	0.24					0.05
v/c Ratio	0.35	0.70	0.93		0.74	0.30
Uniform Delay, d1	11.2	4.6	10.9		26.4	24.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.2	0.8	8.2		19.0	0.5
Delay (s)	12.4	5.5	19.1		45.4	24.8
Level of Service	B	A	B		D	C
Approach Delay (s)		5.7	19.1		34.3	
Approach LOS		A	B		C	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	58.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations			↰↰		↰↰	
Traffic Volume (vph)	0	0	1550	0	420	0
Future Volume (vph)	0	0	1550	0	420	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0		6.0	
Lane Util. Factor			0.97		0.97	
Frt			1.00		1.00	
Flt Protected			0.95		0.95	
Satd. Flow (prot)			3433		3433	
Flt Permitted			0.95		0.95	
Satd. Flow (perm)			3433		3433	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	1649	0	447	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	1649	0	447	0
Turn Type			Prot		Prot	
Protected Phases			4		2	
Permitted Phases						
Actuated Green, G (s)			58.0		20.0	
Effective Green, g (s)			58.0		20.0	
Actuated g/C Ratio			0.64		0.22	
Clearance Time (s)			6.0		6.0	
Vehicle Extension (s)			3.0		3.0	
Lane Grp Cap (vph)			2212		762	
v/s Ratio Prot			c0.48		c0.13	
v/s Ratio Perm						
v/c Ratio			0.75		0.59	
Uniform Delay, d1			10.9		31.3	
Progression Factor			1.00		1.20	
Incremental Delay, d2			2.3		3.3	
Delay (s)			13.3		40.9	
Level of Service			B		D	
Approach Delay (s)	0.0			13.3	40.9	
Approach LOS	A			B	D	

Intersection Summary			
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	122.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBR	NWL	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations										
Traffic Volume (vph)	0	0	0	135	0	1550	0	0	420	1245
Future Volume (vph)	0	0	0	135	0	1550	0	0	420	1245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0	6.0		6.0			6.0	6.0
Lane Util. Factor			1.00	0.95		0.95			0.95	0.88
Frt			0.85	0.85		1.00			1.00	0.85
Flt Protected			1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)			1583	1504		3539			3539	2787
Flt Permitted			1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)			1583	1504		3539			3539	2787
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	144	0	1649	0	0	447	1324
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	201
Lane Group Flow (vph)	0	0	72	72	0	1649	0	0	447	1123
Turn Type			Prot	Prot	Perm	NA			NA	Perm
Protected Phases			4	4		2			2	
Permitted Phases					2					2
Actuated Green, G (s)			10.7	10.7		67.3			67.3	67.3
Effective Green, g (s)			10.7	10.7		67.3			67.3	67.3
Actuated g/C Ratio			0.12	0.12		0.75			0.75	0.75
Clearance Time (s)			6.0	6.0		6.0			6.0	6.0
Vehicle Extension (s)			3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)			188	178		2646			2646	2084
v/s Ratio Prot			0.05	c0.05		c0.47			0.13	
v/s Ratio Perm										0.40
v/c Ratio			0.38	0.40		0.62			0.17	0.54
Uniform Delay, d1			36.6	36.7		5.4			3.3	4.8
Progression Factor			1.00	1.00		0.51			1.00	1.00
Incremental Delay, d2			1.3	1.5		0.7			0.1	1.0
Delay (s)			37.9	38.2		3.4			3.4	5.8
Level of Service			D	D		A			A	A
Approach Delay (s)	0.0		38.1			3.4			5.2	
Approach LOS	A		D			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	190	370	20	80	110	40	10	10	50	140	140
Future Volume (vph)	10	190	370	20	80	110	40	10	10	50	140	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	150		0		150			0		0
Storage Lanes		1	0		0		0			0		0
Taper Length (ft)		25			25					25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.911				0.972					0.945	
Flt Protected		0.983				0.984					0.991	
Satd. Flow (prot)	0	1652	0	0	0	1764	0	0	0	0	1663	0
Flt Permitted		0.983				0.984					0.991	
Satd. Flow (perm)	0	1652	0	0	0	1764	0	0	0	0	1663	0
Link Speed (mph)		30				30					30	
Link Distance (ft)		465				456					371	
Travel Time (s)		10.6				10.4					8.4	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.86	0.86	0.86	0.86	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	7%	7%	7%	7%
Adj. Flow (vph)	11	209	407	22	93	128	47	12	13	63	175	175
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	649	0	0	0	280	0	0	0	0	426	0
Sign Control		Yield				Yield					Yield	

Intersection Summary			
Area Type:	Other		
Control Type: Roundabout			
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		

Lane Group	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR
Lane Configurations		↔					↔	
Traffic Volume (vph)	50	90	120	90	5	40	260	10
Future Volume (vph)	50	90	120	90	5	40	260	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150			150		0
Storage Lanes	0		0			0		0
Taper Length (ft)	25					25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.919					0.996	
Flt Protected		0.993					0.993	
Satd. Flow (prot)	0	1605	0	0	0	0	1756	0
Flt Permitted		0.993					0.993	
Satd. Flow (perm)	0	1605	0	0	0	0	1756	0
Link Speed (mph)		30					30	
Link Distance (ft)		400					528	
Travel Time (s)		9.1					12.0	
Peak Hour Factor	0.60	0.60	0.60	0.60	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	8%	8%	8%	8%	7%	7%	7%	7%
Adj. Flow (vph)	83	150	200	150	6	48	313	12
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	583	0	0	0	0	379	0
Sign Control		Yield					Yield	

Intersection Summary

Intersection	
Intersection Delay, s/veh	21.9
Intersection LOS	C

Approach	WB	NB	SB	NE	SW
Entry Lanes	1	1	1	1	1
Conflicting Circle Lanes	1	1	1	1	1
Adj Approach Flow, veh/h	649	280	426	583	379
Demand Flow Rate, veh/h	668	288	455	630	405
Vehicles Circulating, veh/h	542	555	714	336	963
Vehicles Exiting, veh/h	301	411	654	833	247
Ped Vol Crossing Leg, #/h	0	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000	1.000
Approach Delay, s/veh	28.3	9.3	20.7	14.1	33.4
Approach LOS	D	A	C	B	D

Lane	Left	Left	Left	Left	Left
Designated Moves	LR	LTR	LTR	LTR	LTR
Assumed Moves	LR	LTR	LTR	LTR	LTR
RT Channelized					
Lane Util	1.000	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
Entry Flow, veh/h	668	288	455	630	405
Cap Entry Lane, veh/h	794	783	666	980	517
Entry HV Adj Factor	0.971	0.973	0.936	0.925	0.935
Flow Entry, veh/h	649	280	426	583	379
Cap Entry, veh/h	771	762	623	906	483
V/C Ratio	0.841	0.368	0.683	0.643	0.784
Control Delay, s/veh	28.3	9.3	20.7	14.1	33.4
LOS	D	A	C	B	D
95th %tile Queue, veh	10	2	5	5	7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	20	230	10	40	50	390	140	10	10	110	20
Future Volume (vph)	10	20	230	10	40	50	390	140	10	10	110	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.932			0.998			0.981	
Flt Protected		0.984			0.995			0.965			0.996	
Satd. Flow (prot)	0	1731	1495	0	1678	0	0	1777	0	0	1785	0
Flt Permitted		0.984			0.995			0.965			0.996	
Satd. Flow (perm)	0	1731	1495	0	1678	0	0	1777	0	0	1785	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		144			453			475			436	
Travel Time (s)		3.3			10.3			10.8			9.9	
Peak Hour Factor	0.82	0.82	0.82	0.70	0.70	0.70	0.75	0.75	0.75	0.71	0.71	0.71
Heavy Vehicles (%)	8%	8%	8%	5%	5%	5%	3%	3%	3%	4%	4%	4%
Adj. Flow (vph)	12	24	280	14	57	71	520	187	13	14	155	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	280	0	142	0	0	720	0	0	197	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 59.5%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	41.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↕			↕			↕	
Traffic Vol, veh/h	10	20	230	10	40	50	390	140	10	10	110	20
Future Vol, veh/h	10	20	230	10	40	50	390	140	10	10	110	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	70	70	70	75	75	75	71	71	71
Heavy Vehicles, %	8	8	8	5	5	5	3	3	3	4	4	4
Mvmt Flow	12	24	280	14	57	71	520	187	13	14	155	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1495	1437	169	1583	1445	194	183	0	0	200	0	0
Stage 1	197	197	-	1234	1234	-	-	-	-	-	-	-
Stage 2	1298	1240	-	349	211	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.15	6.55	6.25	4.13	-	-	4.14	-	-
Critical Hdwy Stg 1	6.18	5.58	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.545	4.045	3.345	2.227	-	-	2.236	-	-
Pot Cap-1 Maneuver	98	129	860	86	130	840	1386	-	-	1360	-	-
Stage 1	791	727	-	213	245	-	-	-	-	-	-	-
Stage 2	193	241	-	661	722	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	23	74	860	29	74	840	1386	-	-	1360	-	-
Mov Cap-2 Maneuver	23	74	-	29	74	-	-	-	-	-	-	-
Stage 1	456	719	-	123	141	-	-	-	-	-	-	-
Stage 2	61	139	-	426	714	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	37.3	280.7	6.6	0.5
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1386	-	-	43	860	106	1360	-	-
HCM Lane V/C Ratio	0.375	-	-	0.851	0.326	1.348	0.01	-	-
HCM Control Delay (s)	9.1	0	-	237.3	11.2	280.7	7.7	0	-
HCM Lane LOS	A	A	-	F	B	F	A	A	-
HCM 95th %tile Q(veh)	1.8	-	-	3.3	1.4	10	0	-	-

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	50	20	80	40	200	40	310	70	70	570	50
Future Volume (vph)	30	50	20	80	40	200	40	310	70	70	570	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1767		1736	1827	1553	1770	3441		1787	3531	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1767		1736	1827	1553	1770	3441		1787	3531	
Peak-hour factor, PHF	0.82	0.82	0.82	0.81	0.81	0.81	0.68	0.68	0.68	0.78	0.78	0.78
Adj. Flow (vph)	37	61	24	99	49	247	59	456	103	90	731	64
RTOR Reduction (vph)	0	17	0	0	0	121	0	24	0	0	8	0
Lane Group Flow (vph)	37	68	0	99	49	126	59	535	0	90	787	0
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	4.4	14.3		6.1	16.0	30.2	8.2	25.6		6.1	23.5	
Effective Green, g (s)	4.4	14.3		6.1	16.0	30.2	8.2	25.6		6.1	23.5	
Actuated g/C Ratio	0.06	0.19		0.08	0.21	0.40	0.11	0.34		0.08	0.31	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	101	332		139	384	616	190	1157		143	1090	
v/s Ratio Prot	0.02	0.04		c0.06	0.03	c0.08	0.03	0.16		c0.05	c0.22	
v/s Ratio Perm												
v/c Ratio	0.37	0.20		0.71	0.13	0.20	0.31	0.46		0.63	0.72	
Uniform Delay, d1	34.5	26.1		34.1	24.4	15.1	31.3	19.8		33.9	23.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	0.3		15.8	0.7	0.2	0.9	0.3		8.4	2.4	
Delay (s)	36.8	26.4		50.0	25.1	15.2	32.3	20.1		42.3	25.8	
Level of Service	D	C		D	C	B	C	C		D	C	
Approach Delay (s)		29.5			25.2			21.3			27.5	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	76.1	Sum of lost time (s)	24.0
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	240	0	10	120	260	520
Future Volume (vph)	240	0	10	120	260	520
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	4.0	4.0	6.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	0.95		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787		1770	1863	1845	1568
Flt Permitted	0.95		0.50	1.00	1.00	1.00
Satd. Flow (perm)	1787		928	1863	1845	1568
Peak-hour factor, PHF	0.90	0.90	0.87	0.87	0.89	0.89
Adj. Flow (vph)	267	0	11	138	292	584
RTOR Reduction (vph)	0	0	0	0	0	136
Lane Group Flow (vph)	267	0	11	138	292	448
Heavy Vehicles (%)	1%	1%	2%	2%	3%	3%
Turn Type	Prot		pm+pt	NA	NA	custom
Protected Phases	8		1	6 7	2 7	7 8
Permitted Phases			6 7			2
Actuated Green, G (s)	22.1		32.3	31.5	31.5	55.6
Effective Green, g (s)	22.1		28.3	31.5	31.5	55.6
Actuated g/C Ratio	0.31		0.39	0.44	0.44	0.77
Clearance Time (s)	6.0		6.0			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap (vph)	545		372	810	802	1204
v/s Ratio Prot	c0.15		c0.00	0.07	c0.16	c0.20
v/s Ratio Perm			0.01			0.09
v/c Ratio	0.49		0.03	0.17	0.36	0.37
Uniform Delay, d1	20.5		13.6	12.5	13.7	2.7
Progression Factor	1.00		1.00	1.00	1.04	1.33
Incremental Delay, d2	0.7		0.0	0.1	0.3	0.2
Delay (s)	21.2		13.7	12.6	14.5	3.8
Level of Service	C		B	B	B	A
Approach Delay (s)	21.2			12.7	7.4	
Approach LOS	C			B	A	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	72.4	Sum of lost time (s)	22.0
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	60	10	330	30	10	720
Future Volume (vph)	60	10	330	30	10	720
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0	4.0	6.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1767		1900	1615	1805	1900
Flt Permitted	0.96		1.00	1.00	0.43	1.00
Satd. Flow (perm)	1767		1900	1615	820	1900
Peak-hour factor, PHF	0.87	0.67	0.95	0.84	0.73	0.96
Adj. Flow (vph)	69	15	347	36	14	750
RTOR Reduction (vph)	9	0	0	16	0	0
Lane Group Flow (vph)	75	0	347	20	14	750
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Turn Type	Prot		NA	Perm	custom	NA
Protected Phases	7		6 8		5	2 8
Permitted Phases				6 8	2	
Actuated Green, G (s)	10.0		39.6	39.6	18.3	39.6
Effective Green, g (s)	10.0		39.6	39.6	18.3	39.6
Actuated g/C Ratio	0.14		0.55	0.55	0.25	0.55
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	244		1039	883	218	1039
v/s Ratio Prot	c0.04		0.18		c0.00	c0.39
v/s Ratio Perm				0.01	0.02	
v/c Ratio	0.31		0.33	0.02	0.06	0.72
Uniform Delay, d1	28.1		9.1	7.5	20.5	12.3
Progression Factor	1.00		0.33	0.14	1.00	1.00
Incremental Delay, d2	0.7		0.2	0.0	0.1	2.5
Delay (s)	28.8		3.2	1.1	20.6	14.8
Level of Service	C		A	A	C	B
Approach Delay (s)	28.8		3.0			14.9
Approach LOS	C		A			B

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	72.4	Sum of lost time (s)	22.0
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	30	20	320	700	20
Future Volume (vph)	5	30	20	320	700	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.888				0.995	
Flt Protected	0.992		0.950			
Satd. Flow (prot)	1674	0	1787	1900	1872	0
Flt Permitted	0.992		0.950			
Satd. Flow (perm)	1674	0	1787	1900	1872	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	332			288	365	
Travel Time (s)	7.5			6.5	8.3	
Peak Hour Factor	0.64	0.77	0.71	0.90	0.75	0.55
Heavy Vehicles (%)	0%	0%	1%	0%	1%	0%
Adj. Flow (vph)	8	39	28	356	933	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	0	28	356	969	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	30	20	320	700	20
Future Vol, veh/h	5	30	20	320	700	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	64	77	71	90	75	55
Heavy Vehicles, %	0	0	1	0	1	0
Mvmt Flow	8	39	28	356	933	36

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1363	951	969	0	-	0
Stage 1	951	-	-	-	-	-
Stage 2	412	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	165	318	715	-	-	-
Stage 1	379	-	-	-	-	-
Stage 2	673	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	159	318	715	-	-	-
Mov Cap-2 Maneuver	159	-	-	-	-	-
Stage 1	364	-	-	-	-	-
Stage 2	673	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21	0.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	715	-	272	-	-
HCM Lane V/C Ratio	0.039	-	0.172	-	-
HCM Control Delay (s)	10.2	-	21	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

APPENDIX R-2: ALTERNATIVE D INTERSECTION CAPACITY ANALYSES – HCS PRINTOUTS – PM PEAK HOUR

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1285	1405	0	125	1295
Future Volume (vph)	0	1285	1405	0	125	1295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		0.95	0.95		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3406		1930	2682
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3406		1930	2682
Peak-hour factor, PHF	0.93	0.93	0.88	0.88	0.89	0.89
Adj. Flow (vph)	0	1382	1597	0	140	1455
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1382	1597	0	140	1455
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		60.0	60.0		68.0	68.0
Effective Green, g (s)		60.0	60.0		68.0	68.0
Actuated g/C Ratio		0.43	0.43		0.49	0.49
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1487	1459		937	1302
v/s Ratio Prot		0.40	c0.47		0.07	c0.54
v/s Ratio Perm						
v/c Ratio		0.93	1.09		0.15	1.12
Uniform Delay, d1		38.0	40.0		20.0	36.0
Progression Factor		0.74	0.08		1.00	1.00
Incremental Delay, d2		7.9	43.8		0.1	63.8
Delay (s)		35.8	47.1		20.0	99.8
Level of Service		D	D		C	F
Approach Delay (s)		35.8	47.1		92.8	
Approach LOS		D	D		F	

Intersection Summary			
HCM 2000 Control Delay	59.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	1245	0	1005	0	0	1050	360	0	0	500	235
Future Volume (vph)	1245	0	1005	0	0	1050	360	0	0	500	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0	6.0			6.0	4.0
Lane Util. Factor	0.97		0.88			0.97	0.95			0.95	1.00
Frt	1.00		0.85			1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)	3242		2632			3335	3438			3505	1568
Flt Permitted	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (perm)	3242		2632			3335	3438			3505	1568
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	1415	0	1142	0	0	1117	383	0	0	543	255
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1415	0	1142	0	0	1117	383	0	0	543	255
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Actuated Green, G (s)	55.0		55.0			42.0	73.0			25.0	140.0
Effective Green, g (s)	55.0		55.0			42.0	73.0			25.0	140.0
Actuated g/C Ratio	0.39		0.39			0.30	0.52			0.18	1.00
Clearance Time (s)	6.0		6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	1273		1034			1000	1792			625	1568
v/s Ratio Prot	c0.44		0.43			c0.33	0.11			c0.15	
v/s Ratio Perm											0.16
v/c Ratio	1.11		1.10			1.12	0.21			0.87	0.16
Uniform Delay, d1	42.5		42.5			49.0	18.0			55.9	0.0
Progression Factor	1.00		1.00			0.44	0.21			1.00	1.00
Incremental Delay, d2	61.7		61.2			60.1	0.1			15.2	0.2
Delay (s)	104.2		103.7			81.8	3.9			71.1	0.2
Level of Service	F		F			F	A			E	A
Approach Delay (s)		103.9		0.0			61.9			48.4	
Approach LOS		F		A			E			D	

Intersection Summary			
HCM 2000 Control Delay	81.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	650	460	165	580	0	0	0	0	185	0	390
Future Volume (vph)	0	650	460	165	580	0	0	0	0	185	0	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3471	1553	1719	3438					3367		1553
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3471	1553	1719	3438					3367		1553
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	0	747	529	192	674	0	0	0	0	203	0	429
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	179
Lane Group Flow (vph)	0	747	529	192	674	0	0	0	0	203	0	250
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Actuated Green, G (s)		37.2	90.0	14.4	57.6					20.4		20.4
Effective Green, g (s)		37.2	90.0	14.4	57.6					20.4		20.4
Actuated g/C Ratio		0.41	1.00	0.16	0.64					0.23		0.23
Clearance Time (s)		6.0		6.0	6.0					6.0		6.0
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Lane Grp Cap (vph)		1434	1553	275	2200					763		352
v/s Ratio Prot		c0.22		c0.11	0.20					0.06		c0.16
v/s Ratio Perm			0.34									
v/c Ratio		0.52	0.34	0.70	0.31					0.27		0.71
Uniform Delay, d1		19.7	0.0	35.7	7.3					28.6		32.1
Progression Factor		1.00	1.00	0.33	0.03					1.00		1.00
Incremental Delay, d2		1.4	0.6	6.1	0.2					0.2		6.6
Delay (s)		21.1	0.6	18.0	0.4					28.8		38.7
Level of Service		C	A	B	A					C		D
Approach Delay (s)		12.6			4.3			0.0			35.5	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	445	390	0	0	385	235	360	0	380	0	0	0
Future Volume (vph)	445	390	0	0	385	235	360	0	380	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1752	3505			3505	1568	1703		1524			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1752	3505			3505	1568	1703		1524			
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.67	0.67	0.67	0.92	0.92	0.92
Adj. Flow (vph)	484	424	0	0	423	258	537	0	567	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	269	0	0	0
Lane Group Flow (vph)	484	424	0	0	423	258	537	0	298	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	6%	6%	6%	2%	2%	2%
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Actuated Green, G (s)	25.0	48.6			17.6	90.0	29.4		29.4			
Effective Green, g (s)	25.0	48.6			17.6	90.0	29.4		29.4			
Actuated g/C Ratio	0.28	0.54			0.20	1.00	0.33		0.33			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Lane Grp Cap (vph)	486	1892			685	1568	556		497			
v/s Ratio Prot	c0.28	0.12			c0.12		c0.32		0.20			
v/s Ratio Perm						0.16						
v/c Ratio	1.00	0.22			0.62	0.16	0.97		0.60			
Uniform Delay, d1	32.4	10.8			33.1	0.0	29.8		25.4			
Progression Factor	0.33	0.34			1.00	1.00	1.00		1.00			
Incremental Delay, d2	36.8	0.3			4.1	0.2	29.4		2.0			
Delay (s)	47.5	3.9			37.3	0.2	59.2		27.4			
Level of Service	D	A			D	A	E		C			
Approach Delay (s)		27.1			23.2			42.9			0.0	
Approach LOS		C			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	5	210	10	0	10	410	910	120	5	650	120
Future Volume (vph)	10	5	210	10	0	10	410	910	120	5	650	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.93		1.00	0.98		1.00	0.98	
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1801	1583		1729		1770	3478		1770	3457	
Flt Permitted		0.88	1.00		0.83		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1636	1583		1477		1770	3478		1770	3457	
Peak-hour factor, PHF	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	5	228	40	0	40	446	989	130	5	707	130
RTOR Reduction (vph)	0	0	138	0	75	0	0	8	0	0	14	0
Lane Group Flow (vph)	0	16	90	0	5	0	446	1111	0	5	823	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	custom	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Actuated Green, G (s)		4.9	30.5		4.9		23.6	53.2		0.9	30.5	
Effective Green, g (s)		4.9	30.5		4.9		23.6	53.2		0.9	30.5	
Actuated g/C Ratio		0.06	0.40		0.06		0.31	0.69		0.01	0.40	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		104	627		93		542	2402		20	1369	
v/s Ratio Prot							c0.25	0.32		0.00	c0.24	
v/s Ratio Perm		c0.01	0.06		0.00							
v/c Ratio		0.15	0.14		0.05		0.82	0.46		0.25	0.60	
Uniform Delay, d1		34.1	14.9		33.9		24.8	5.4		37.7	18.4	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7	0.1		0.2		9.8	0.1		6.5	0.7	
Delay (s)		34.8	15.0		34.1		34.5	5.5		44.2	19.2	
Level of Service		C	B		C		C	A		D	B	
Approach Delay (s)		16.3			34.1			13.8			19.3	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	77.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	30	5	260	0	40	0	790	130	15	420	0
Future Volume (vph)	20	30	5	260	0	40	0	790	130	15	420	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			0.98			0.98			1.00	
Flt Protected		0.98			0.96			1.00			1.00	
Satd. Flow (prot)		1808			1736			1726			1806	
Flt Permitted		0.87			0.74			1.00			0.80	
Satd. Flow (perm)		1610			1338			1726			1455	
Peak-hour factor, PHF	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	33	50	8	271	0	42	0	888	146	17	488	0
RTOR Reduction (vph)	0	4	0	0	28	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	87	0	0	285	0	0	1027	0	0	505	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Actuated Green, G (s)		20.1			20.1			55.8			55.8	
Effective Green, g (s)		20.1			20.1			55.8			55.8	
Actuated g/C Ratio		0.23			0.23			0.63			0.63	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		368			305			1095			923	
v/s Ratio Prot								c0.60				
v/s Ratio Perm		0.05			c0.21						0.35	
v/c Ratio		0.24			0.94			0.94			0.55	
Uniform Delay, d1		27.6			33.3			14.5			9.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.3			34.6			14.6			0.7	
Delay (s)		28.0			67.9			29.1			9.6	
Level of Service		C			E			C			A	
Approach Delay (s)		28.0			67.9			29.1			9.6	
Approach LOS		C			E			C			A	

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	87.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	70	320	30	110	370	40	100	450	40	50	340	80
Future Volume (vph)	70	320	30	110	370	40	100	450	40	50	340	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1821		1752	1845	1568	1787	1858		1787	1828	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1821		1752	1845	1568	1787	1858		1787	1828	
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95	0.94	0.94	0.94
Adj. Flow (vph)	77	352	33	118	398	43	105	474	42	53	362	85
RTOR Reduction (vph)	0	4	0	0	0	29	0	3	0	0	9	0
Lane Group Flow (vph)	77	381	0	118	398	14	105	513	0	53	438	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4	5	5	2		1	6	
Permitted Phases						4						
Actuated Green, G (s)	7.1	18.4		7.9	19.2	26.4	7.2	29.5		2.8	25.1	
Effective Green, g (s)	7.1	18.4		7.9	19.2	26.4	7.2	29.5		2.8	25.1	
Actuated g/C Ratio	0.09	0.22		0.10	0.23	0.32	0.09	0.36		0.03	0.30	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	150	405		167	428	615	155	663		60	555	
v/s Ratio Prot	0.04	0.21		c0.07	c0.22	0.00	c0.06	c0.28		0.03	0.24	
v/s Ratio Perm						0.01						
v/c Ratio	0.51	0.94		0.71	0.93	0.02	0.68	0.77		0.88	0.79	
Uniform Delay, d1	36.1	31.6		36.2	31.0	19.3	36.6	23.6		39.7	26.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.9	30.1		12.8	26.5	0.0	11.1	8.6		75.4	7.3	
Delay (s)	39.0	61.6		49.0	57.5	19.3	47.7	32.1		115.1	33.7	
Level of Service	D	E		D	E	B	D	C		F	C	
Approach Delay (s)		57.9			52.8			34.8			42.3	
Approach LOS		E			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	46.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	82.6	Sum of lost time (s)	24.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	790	10	5	160	100	350
Future Volume (vph)	790	10	5	160	100	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	120	0			220
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.998		
Satd. Flow (prot)	1787	1599	0	1859	1881	1599
Flt Permitted	0.950			0.998		
Satd. Flow (perm)	1787	1599	0	1859	1881	1599
Link Speed (mph)	30			30	30	
Link Distance (ft)	322			309	354	
Travel Time (s)	7.3			7.0	8.0	
Peak Hour Factor	0.90	0.90	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	1%	2%	2%	1%	1%
Adj. Flow (vph)	878	11	6	184	115	402
Shared Lane Traffic (%)						
Lane Group Flow (vph)	878	11	0	190	115	402
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 65.6%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	205.3
Intersection LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	790	10	5	160	100	350
Future Vol, veh/h	790	10	5	160	100	350
Peak Hour Factor	0.90	0.90	0.87	0.87	0.87	0.87
Heavy Vehicles, %	1	1	2	2	1	1
Mvmt Flow	878	11	6	184	115	402
Number of Lanes	1	1	0	1	1	1

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	2
HCM Control Delay	351.4	17.2	23.2
HCM LOS	F	C	C

Lane	NBLn1	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	3%	100%	0%	0%	0%
Vol Thru, %	97%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	165	790	10	100	350
LT Vol	5	790	0	0	0
Through Vol	160	0	0	100	0
RT Vol	0	0	10	0	350
Lane Flow Rate	190	878	11	115	402
Geometry Grp	4	7	7	7	7
Degree of Util (X)	0.372	1.733	0.018	0.217	0.683
Departure Headway (Hd)	8.951	7.109	5.891	8.584	7.859
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	406	518	611	421	463
Service Time	6.951	4.809	3.591	6.284	5.559
HCM Lane V/C Ratio	0.468	1.695	0.018	0.273	0.868
HCM Control Delay	17.2	355.7	8.7	13.6	25.9
HCM Lane LOS	C	F	A	B	D
HCM 95th-tile Q	1.7	52.6	0.1	0.8	5.1

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	0	0	950	450	10
Future Volume (vph)	10	0	0	950	450	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.997	
Flt Protected	0.950					
Satd. Flow (prot)	1703	0	0	1881	1876	0
Flt Permitted	0.950					
Satd. Flow (perm)	1703	0	0	1881	1876	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	160			224	319	
Travel Time (s)	3.6			5.1	7.3	
Peak Hour Factor	0.50	0.50	0.93	0.93	0.86	0.86
Heavy Vehicles (%)	6%	6%	1%	1%	1%	1%
Adj. Flow (vph)	20	0	0	1022	523	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	0	0	1022	535	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 66.4%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	0	0	950	450	10
Future Vol, veh/h	10	0	0	950	450	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	93	93	86	86
Heavy Vehicles, %	6	6	1	1	1	1
Mvmt Flow	20	0	0	1022	523	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1551	529	535	0	-	0
Stage 1	529	-	-	-	-	-
Stage 2	1022	-	-	-	-	-
Critical Hdwy	6.46	6.26	4.11	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.354	2.209	-	-	-
Pot Cap-1 Maneuver	122	542	1038	-	-	-
Stage 1	583	-	-	-	-	-
Stage 2	341	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	122	542	1038	-	-	-
Mov Cap-2 Maneuver	122	-	-	-	-	-
Stage 1	583	-	-	-	-	-
Stage 2	341	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	40.2	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1038	-	122	-	-
HCM Lane V/C Ratio	-	-	0.164	-	-
HCM Control Delay (s)	0	-	40.2	-	-
HCM Lane LOS	A	-	E	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	50	900	10	20	260	10	50	20	170	30	10	10
Future Volume (vph)	50	900	10	20	260	10	50	20	170	30	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	150		150	0		0	150		150
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.995			0.904			0.973	
Flt Protected		0.997			0.997			0.990			0.971	
Satd. Flow (prot)	0	1874	0	0	1848	0	0	1700	0	0	1795	0
Flt Permitted		0.997			0.997			0.990			0.971	
Satd. Flow (perm)	0	1874	0	0	1848	0	0	1700	0	0	1795	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		327			240			246			251	
Travel Time (s)		7.4			5.5			5.6			5.7	
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.67	0.67	0.67	0.82	0.82	0.82
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	53	957	11	23	295	11	75	30	254	37	12	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1021	0	0	329	0	0	359	0	0	61	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 84.6%		ICU Level of Service E	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	37.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	50	900	10	20	260	10	50	20	170	30	10	10
Future Vol, veh/h	50	900	10	20	260	10	50	20	170	30	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	88	88	88	67	67	67	82	82	82
Heavy Vehicles, %	1	1	1	2	2	2	0	0	0	0	0	0
Mvmt Flow	53	957	11	23	295	11	75	30	254	37	12	12

Major/Minor	Major1			Major2			Minor2			Minor1		
Conflicting Flow All	306	0	0	968	0	0	1428	1421	301	1431	1421	963
Stage 1	-	-	-	-	-	-	347	347	-	1069	1069	-
Stage 2	-	-	-	-	-	-	1081	1074	-	362	352	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1260	-	-	712	-	-	114	138	743	113	138	313
Stage 1	-	-	-	-	-	-	673	638	-	270	300	-
Stage 2	-	-	-	-	-	-	266	299	-	661	635	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1260	-	-	712	-	-	91	121	743	55	121	313
Mov Cap-2 Maneuver	-	-	-	-	-	-	91	121	-	55	121	-
Stage 1	-	-	-	-	-	-	612	613	-	245	273	-
Stage 2	-	-	-	-	-	-	222	272	-	398	610	-

Approach	EB	WB	SE	NW
HCM Control Delay, s	0.4	0.7	160.2	146
HCM LOS			F	F

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	WBL	WBT	WBR	SELn1
Capacity (veh/h)	76	1260	-	-	712	-	-	295
HCM Lane V/C Ratio	0.802	0.042	-	-	0.032	-	-	1.214
HCM Control Delay (s)	146	8	0	-	10.2	0	-	160.2
HCM Lane LOS	F	A	A	-	B	A	-	F
HCM 95th %tile Q(veh)	3.9	0.1	-	-	0.1	-	-	16.2

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	70	340	190	650	530	0	300	480	110	30	250	930
Future Volume (vph)	70	340	190	650	530	0	300	480	110	30	250	930
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.97	1.00	1.00	1.00	1.00	0.88
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	3539		3433	1863	1583	1787	1881	2814
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	3539		3433	1863	1583	1787	1881	2814
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.96	0.96	0.96	0.95	0.95	0.95
Adj. Flow (vph)	76	370	207	691	564	0	312	500	115	32	263	979
RTOR Reduction (vph)	0	0	151	0	0	0	0	0	0	0	0	57
Lane Group Flow (vph)	76	370	56	691	564	0	313	500	115	32	263	922
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	1	6	7	5	2		3	8		7	4	4 5
Permitted Phases		6	6		2			8	Free		4	
Actuated Green, G (s)	11.0	16.7	25.4	29.3	35.0		16.0	41.3	120.0	8.7	34.0	69.3
Effective Green, g (s)	11.0	16.7	25.4	29.3	35.0		16.0	41.3	120.0	8.7	34.0	69.3
Actuated g/C Ratio	0.09	0.14	0.21	0.24	0.29		0.13	0.34	1.00	0.07	0.28	0.58
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	162	492	414	838	1032		457	641	1583	129	532	1625
v/s Ratio Prot	0.04	c0.10	0.01	c0.20	0.16		c0.09	c0.27		0.02	0.14	0.33
v/s Ratio Perm			0.03						0.07			
v/c Ratio	0.47	0.75	0.14	0.82	0.55		0.68	0.78	0.07	0.25	0.49	0.57
Uniform Delay, d1	51.7	49.7	38.4	42.9	35.8		49.6	35.3	0.0	52.6	35.8	15.9
Progression Factor	1.00	1.00	1.00	1.13	0.76		1.00	1.00	1.00	1.47	0.67	0.62
Incremental Delay, d2	2.1	10.2	0.2	5.9	1.8		4.2	6.1	0.1	0.8	0.6	0.4
Delay (s)	53.9	59.8	38.5	54.5	28.9		53.8	41.4	0.1	78.0	24.7	10.3
Level of Service	D	E	D	D	C		D	D	A	E	C	B
Approach Delay (s)		52.4			43.0			40.5			14.9	
Approach LOS		D			D			D			B	

Intersection Summary			
HCM 2000 Control Delay	35.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	310	110	800	530	90	920
Future Volume (vph)	310	110	800	530	90	920
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	4.0	6.0	6.0
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	1599	3574	1599	1787	3574
Flt Permitted	0.95	1.00	1.00	1.00	0.16	1.00
Satd. Flow (perm)	1787	1599	3574	1599	295	3574
Peak-hour factor, PHF	0.86	0.86	0.96	0.96	0.85	0.85
Adj. Flow (vph)	360	128	833	552	106	1082
RTOR Reduction (vph)	0	20	0	0	0	0
Lane Group Flow (vph)	360	108	833	552	106	1082
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	pm+ov	NA	Free	pm+pt	NA
Protected Phases	1 2 5 6	7	8		7	3 4
Permitted Phases		1 2 5 6		Free	3 4	
Actuated Green, G (s)	52.0	60.7	41.3	120.0	56.0	56.0
Effective Green, g (s)	52.0	60.7	41.3	120.0	56.0	56.0
Actuated g/C Ratio	0.43	0.51	0.34	1.00	0.47	0.47
Clearance Time (s)		6.0	6.0		6.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)	774	888	1230	1599	245	1667
v/s Ratio Prot	c0.20	0.01	c0.23		0.03	c0.30
v/s Ratio Perm		0.06		0.35	0.17	
v/c Ratio	0.47	0.12	0.68	0.35	0.43	0.65
Uniform Delay, d1	24.1	15.6	33.7	0.0	21.4	24.5
Progression Factor	1.00	1.00	1.15	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1	1.0	0.4	1.2	0.9
Delay (s)	24.6	15.7	39.8	0.4	22.6	25.4
Level of Service	C	B	D	A	C	C
Approach Delay (s)	22.2		24.1			25.1
Approach LOS	C		C			C

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

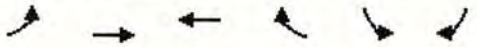
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	380	1475	5	20	1290	120	15	10	15	10	10	160
Future Volume (vph)	380	1475	5	20	1290	120	15	10	15	10	10	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1787	3573		1787	3529			1844	1615		1835	1599
Flt Permitted	0.95	1.00		0.95	1.00			0.80	1.00		0.83	1.00
Satd. Flow (perm)	1787	3573		1787	3529			1518	1615		1557	1599
Peak-hour factor, PHF	0.97	0.97	0.97	0.95	0.95	0.95	0.90	0.90	0.90	0.80	0.80	0.80
Adj. Flow (vph)	392	1521	5	21	1358	126	17	11	17	12	12	200
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	16	0	0	19
Lane Group Flow (vph)	392	1526	0	21	1479	0	0	28	1	0	26	181
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases							8		8	4	4	4
Actuated Green, G (s)	31.2	93.4		3.3	65.5			5.3	5.3		5.3	36.5
Effective Green, g (s)	31.2	93.4		3.3	65.5			5.3	5.3		5.3	36.5
Actuated g/C Ratio	0.26	0.78		0.03	0.55			0.04	0.04		0.04	0.30
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	464	2780		49	1926			67	71		68	566
v/s Ratio Prot	c0.22	0.43		0.01	c0.42							c0.08
v/s Ratio Perm								0.02	0.00		0.02	0.03
v/c Ratio	0.84	0.55		0.43	0.77			0.42	0.01		0.38	0.32
Uniform Delay, d1	42.1	5.1		57.4	21.3			55.8	54.8		55.8	32.2
Progression Factor	0.97	1.30		1.20	0.94			1.00	1.00		1.00	1.00
Incremental Delay, d2	7.6	0.4		4.6	2.3			4.2	0.1		3.6	0.3
Delay (s)	48.5	7.1		73.7	22.4			60.0	54.9		59.3	32.5
Level of Service	D	A		E	C			E	D		E	C
Approach Delay (s)		15.6			23.1			58.1			35.6	
Approach LOS		B			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	1550	10	5	1240	410	40	10	10	200	5	280
Future Volume (vph)	150	1550	10	5	1240	410	40	10	10	200	5	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	3467	3571		1770	3539	1583	1805	1758		1715	1723	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.45	1.00
Satd. Flow (perm)	3467	3571		1770	3539	1583	1805	1758		1715	813	1615
Peak-hour factor, PHF	0.84	0.84	0.84	0.90	0.90	0.90	0.78	0.78	0.78	0.86	0.86	0.86
Adj. Flow (vph)	179	1845	12	6	1378	456	51	13	13	233	6	326
RTOR Reduction (vph)	0	0	0	0	0	133	0	12	0	0	0	111
Lane Group Flow (vph)	179	1857	0	6	1378	323	51	14	0	119	120	215
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	pt+ov
Protected Phases	5	2		1	6	7	3	8		7	4	4 5
Permitted Phases		2			6	6		8				
Actuated Green, G (s)	9.1	63.0		1.0	54.9	76.8	7.7	10.1		21.9	38.0	39.4
Effective Green, g (s)	9.1	63.0		1.0	54.9	76.8	7.7	10.1		21.9	38.0	39.4
Actuated g/C Ratio	0.08	0.52		0.01	0.46	0.64	0.06	0.08		0.18	0.32	0.33
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	262	1874		14	1619	1092	115	147		312	423	530
v/s Ratio Prot	c0.05	c0.52		0.00	0.39	0.05	0.03	0.01		c0.07	0.05	c0.13
v/s Ratio Perm						0.15					0.04	
v/c Ratio	0.68	0.99		0.43	0.85	0.30	0.44	0.10		0.38	0.28	0.41
Uniform Delay, d1	54.0	28.2		59.2	28.9	9.6	54.1	50.7		43.1	30.8	31.2
Progression Factor	1.00	1.00		1.00	0.74	0.07	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.2	18.7		16.3	3.7	0.1	2.7	0.3		0.8	0.4	0.5
Delay (s)	61.2	46.9		75.5	25.1	0.8	56.8	51.0		43.9	31.2	31.7
Level of Service	E	D		E	C	A	E	D		D	C	C
Approach Delay (s)		48.2			19.3			54.8			34.2	
Approach LOS		D			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	200	1770	1450	40	20	80
Future Volume (vph)	200	1770	1450	40	20	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			0	0	175
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.996			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3525	0	1752	1568
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	3539	3525	0	1752	1568
Link Speed (mph)		30	30		30	
Link Distance (ft)		535	210		522	
Travel Time (s)		12.2	4.8		11.9	
Peak Hour Factor	0.91	0.91	0.90	0.90	0.75	0.75
Heavy Vehicles (%)	2%	2%	2%	2%	3%	3%
Adj. Flow (vph)	220	1945	1611	44	27	107
Shared Lane Traffic (%)						
Lane Group Flow (vph)	220	1945	1655	0	27	107
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 65.8%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	30.8

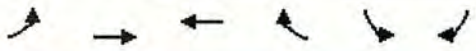
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	200	1770	1450	40	20	80
Future Vol, veh/h	200	1770	1450	40	20	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	-	0	175
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	90	90	75	75
Heavy Vehicles, %	2	2	2	2	3	3
Mvmt Flow	220	1945	1611	44	27	107

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1655	0	-	0	3046	828
Stage 1	-	-	-	-	1633	-
Stage 2	-	-	-	-	1413	-
Critical Hdwy	4.14	-	-	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	5.86	-
Follow-up Hdwy	2.22	-	-	-	3.53	3.33
Pot Cap-1 Maneuver	386	-	-	-	~ 10	312
Stage 1	-	-	-	-	143	-
Stage 2	-	-	-	-	189	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	386	-	-	-	~ 4	312
Mov Cap-2 Maneuver	-	-	-	-	~ 4	-
Stage 1	-	-	-	-	61	-
Stage 2	-	-	-	-	189	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	$ 869.9
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	386	-	-	-	4	312
HCM Lane V/C Ratio	0.569	-	-	-	6.667	0.342
HCM Control Delay (s)	26	-	-	-	$ 4259.8	22.4
HCM Lane LOS	D	-	-	-	F	C
HCM 95th %tile Q(veh)	3.4	-	-	-	4.9	1.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	140	1360	1415	270	120	70
Future Volume (vph)	140	1360	1415	270	120	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3454		1770	1583
Flt Permitted	0.08	1.00	1.00		0.95	1.00
Satd. Flow (perm)	148	3539	3454		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	1478	1538	293	130	76
RTOR Reduction (vph)	0	0	20	0	0	27
Lane Group Flow (vph)	152	1478	1811	0	130	49
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Actuated Green, G (s)	55.7	55.7	44.5		7.3	12.5
Effective Green, g (s)	55.7	55.7	44.5		7.3	12.5
Actuated g/C Ratio	0.74	0.74	0.59		0.10	0.17
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	222	2628	2049		172	390
v/s Ratio Prot	0.05	c0.42	c0.52		c0.07	0.01
v/s Ratio Perm	0.46					0.02
v/c Ratio	0.68	0.56	0.88		0.76	0.13
Uniform Delay, d1	15.1	4.3	13.0		33.0	26.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	8.4	0.3	4.9		17.1	0.1
Delay (s)	23.6	4.5	18.0		50.1	26.7
Level of Service	C	A	B		D	C
Approach Delay (s)		6.3	18.0		41.5	
Approach LOS		A	B		D	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations			↰↰		↰↰	
Traffic Volume (vph)	0	0	1380	0	375	0
Future Volume (vph)	0	0	1380	0	375	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0		6.0	
Lane Util. Factor			0.97		0.97	
Frt			1.00		1.00	
Flt Protected			0.95		0.95	
Satd. Flow (prot)			3433		3433	
Flt Permitted			0.95		0.95	
Satd. Flow (perm)			3433		3433	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	1468	0	399	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	1468	0	399	0
Turn Type			Prot		Prot	
Protected Phases			4		2	
Permitted Phases						
Actuated Green, G (s)			56.0		22.0	
Effective Green, g (s)			56.0		22.0	
Actuated g/C Ratio			0.62		0.24	
Clearance Time (s)			6.0		6.0	
Vehicle Extension (s)			3.0		3.0	
Lane Grp Cap (vph)			2136		839	
v/s Ratio Prot			c0.43		c0.12	
v/s Ratio Perm						
v/c Ratio			0.69		0.48	
Uniform Delay, d1			11.2		29.1	
Progression Factor			1.00		1.21	
Incremental Delay, d2			1.8		1.9	
Delay (s)			13.0		37.2	
Level of Service			B		D	
Approach Delay (s)	0.0			13.0	37.2	
Approach LOS	A			B	D	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	112.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBR	NWL	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations										
Traffic Volume (vph)	0	0	0	120	0	1380	0	0	375	1110
Future Volume (vph)	0	0	0	120	0	1380	0	0	375	1110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0	6.0		6.0			6.0	6.0
Lane Util. Factor			1.00	0.95		0.95			0.95	0.88
Frt			0.85	0.85		1.00			1.00	0.85
Flt Protected			1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)			1583	1504		3539			3539	2787
Flt Permitted			1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)			1583	1504		3539			3539	2787
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	128	0	1468	0	0	399	1181
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	226
Lane Group Flow (vph)	0	0	64	64	0	1468	0	0	399	955
Turn Type			Prot	Prot	Perm	NA			NA	Perm
Protected Phases			4	4		2			2	
Permitted Phases					2					2
Actuated Green, G (s)			10.2	10.2		67.8			67.8	67.8
Effective Green, g (s)			10.2	10.2		67.8			67.8	67.8
Actuated g/C Ratio			0.11	0.11		0.75			0.75	0.75
Clearance Time (s)			6.0	6.0		6.0			6.0	6.0
Vehicle Extension (s)			3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)			179	170		2666			2666	2099
v/s Ratio Prot			0.04	c0.04		c0.41			0.11	
v/s Ratio Perm										0.34
v/c Ratio			0.36	0.38		0.55			0.15	0.46
Uniform Delay, d1			36.9	37.0		4.7			3.1	4.2
Progression Factor			1.00	1.00		0.50			1.00	1.00
Incremental Delay, d2			1.2	1.4		0.6			0.1	0.7
Delay (s)			38.1	38.4		2.9			3.2	4.9
Level of Service			D	D		A			A	A
Approach Delay (s)	0.0		38.2			2.9			4.5	
Approach LOS	A		D			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	220	360	30	80	120	70	10	10	390	190	30
Future Volume (vph)	10	220	360	30	80	120	70	10	10	390	190	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.915				0.962					0.993	
Flt Protected		0.982				0.986					0.969	
Satd. Flow (prot)	0	1690	0	0	0	1767	0	0	0	0	1810	0
Flt Permitted		0.982				0.986					0.969	
Satd. Flow (perm)	0	1690	0	0	0	1767	0	0	0	0	1810	0
Link Speed (mph)		30				30					30	
Link Distance (ft)		449				456					370	
Travel Time (s)		10.2				10.4					8.4	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.87	0.87	0.87	0.87	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%	2%	2%	1%	1%	1%	1%
Adj. Flow (vph)	11	242	396	33	92	138	80	11	11	424	207	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	682	0	0	0	321	0	0	0	0	675	0
Sign Control		Yield				Yield					Yield	

Intersection Summary

Area Type: Other
Control Type: Roundabout
Intersection Capacity Utilization 137.4% ICU Level of Service H
Analysis Period (min) 15

Lane Group	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR
Lane Configurations								
Traffic Volume (vph)	30	180	320	70	10	30	170	15
Future Volume (vph)	30	180	320	70	10	30	170	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.912					0.991	
Flt Protected		0.998					0.991	
Satd. Flow (prot)	0	1712	0	0	0	0	1829	0
Flt Permitted		0.998					0.991	
Satd. Flow (perm)	0	1712	0	0	0	0	1829	0
Link Speed (mph)		30					30	
Link Distance (ft)		390					523	
Travel Time (s)		8.9					11.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%	2%	2%
Adj. Flow (vph)	33	200	356	78	11	33	187	16
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	667	0	0	0	0	247	0
Sign Control		Yield					Yield	

Intersection Summary

Intersection	
Intersection Delay, s/veh	38.3
Intersection LOS	E

Approach	WB	NB	SB	NE	SW
Entry Lanes	1	1	1	1	1
Conflicting Circle Lanes	1	1	1	1	1
Adj Approach Flow, veh/h	682	321	675	667	247
Demand Flow Rate, veh/h	688	328	681	674	252
Vehicles Circulating, veh/h	563	1045	585	704	923
Vehicles Exiting, veh/h	810	333	590	562	328
Ped Vol Crossing Leg, #/h	0	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000	1.000
Approach Delay, s/veh	33.6	26.7	35.6	60.1	15.0
Approach LOS	D	D	E	F	C

Lane	Left	Left	Left	Left	Left
Designated Moves	LR	LTR	LTR	LTR	LTR
Assumed Moves	LR	LTR	LTR	LTR	LTR
RT Channelized					
Lane Util	1.000	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
Entry Flow, veh/h	688	328	681	674	252
Cap Entry Lane, veh/h	777	475	760	673	538
Entry HV Adj Factor	0.991	0.979	0.991	0.990	0.980
Flow Entry, veh/h	682	321	675	667	247
Cap Entry, veh/h	770	466	753	666	528
V/C Ratio	0.885	0.690	0.896	1.001	0.468
Control Delay, s/veh	33.6	26.7	35.6	60.1	15.0
LOS	D	D	E	F	C
95th %tile Queue, veh	11	5	12	16	2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	50	500	10	30	20	320	130	10	25	110	10
Future Volume (vph)	5	50	500	10	30	20	320	130	10	25	110	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.956			0.997			0.991	
Flt Protected		0.995			0.992			0.966			0.992	
Satd. Flow (prot)	0	1853	1583	0	1802	0	0	1812	0	0	1849	0
Flt Permitted		0.995			0.992			0.966			0.992	
Satd. Flow (perm)	0	1853	1583	0	1802	0	0	1812	0	0	1849	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		168			453			475			436	
Travel Time (s)		3.8			10.3			10.8			9.9	
Peak Hour Factor	0.88	0.88	0.88	0.82	0.82	0.82	0.93	0.93	0.93	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	6	57	568	12	37	24	344	140	11	27	121	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	63	568	0	73	0	0	495	0	0	159	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 51.9%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	14.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↕			↕			↕	
Traffic Vol, veh/h	5	50	500	10	30	20	320	130	10	25	110	10
Future Vol, veh/h	5	50	500	10	30	20	320	130	10	25	110	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	82	82	82	93	93	93	91	91	91
Heavy Vehicles, %	2	2	2	0	0	0	1	1	1	1	1	1
Mvmt Flow	6	57	568	12	37	24	344	140	11	27	121	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1045	1020	127	1327	1020	146	132	0	0	151	0	0
Stage 1	181	181	-	834	834	-	-	-	-	-	-	-
Stage 2	864	839	-	493	186	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	207	237	923	134	239	906	1459	-	-	1436	-	-
Stage 1	821	750	-	365	386	-	-	-	-	-	-	-
Stage 2	349	381	-	562	750	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	134	172	923	31	174	906	1459	-	-	1436	-	-
Mov Cap-2 Maneuver	134	172	-	31	174	-	-	-	-	-	-	-
Stage 1	609	735	-	271	286	-	-	-	-	-	-	-
Stage 2	220	283	-	195	735	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.2	78.3	5.7	1.3
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1459	-	-	168	923	116	1436	-	-
HCM Lane V/C Ratio	0.236	-	-	0.372	0.616	0.631	0.019	-	-
HCM Control Delay (s)	8.2	0	-	38.6	14.9	78.3	7.6	0	-
HCM Lane LOS	A	A	-	E	B	F	A	A	-
HCM 95th %tile Q(veh)	0.9	-	-	1.6	4.4	3.2	0.1	-	-

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	70	30	50	40	210	90	840	70	20	360	40
Future Volume (vph)	30	70	30	50	40	210	90	840	70	20	360	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1780		1787	1881	1599	1805	3568		1805	3556	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1780		1787	1881	1599	1805	3568		1805	3556	
Peak-hour factor, PHF	0.99	0.99	0.99	0.95	0.95	0.95	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	30	71	30	53	42	221	101	944	79	22	387	43
RTOR Reduction (vph)	0	18	0	0	0	125	0	7	0	0	11	0
Lane Group Flow (vph)	30	83	0	53	42	96	101	1016	0	22	419	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases		6			2							
Actuated Green, G (s)	2.6	14.8		4.2	16.4	31.3	8.9	26.1		2.6	19.8	
Effective Green, g (s)	2.6	14.8		4.2	16.4	31.3	8.9	26.1		2.6	19.8	
Actuated g/C Ratio	0.04	0.21		0.06	0.23	0.44	0.12	0.36		0.04	0.28	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	64	367		104	430	698	224	1298		65	981	
v/s Ratio Prot	0.02	c0.05		c0.03	0.02	0.06	c0.06	c0.28		0.01	0.12	
v/s Ratio Perm												
v/c Ratio	0.47	0.23		0.51	0.10	0.14	0.45	0.78		0.34	0.43	
Uniform Delay, d1	33.9	23.7		32.8	21.8	12.1	29.1	20.3		33.7	21.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.3	0.3		3.9	0.5	0.1	1.4	3.2		3.1	0.3	
Delay (s)	39.2	24.0		36.6	22.3	12.2	30.6	23.4		36.8	21.6	
Level of Service	D	C		D	C	B	C	C		D	C	
Approach Delay (s)		27.5			17.6			24.1			22.3	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	71.7	Sum of lost time (s)	24.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	710	5	10	260	200	340
Future Volume (vph)	710	5	10	260	200	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	4.0	4.0	6.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	0.95		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1790		1770	1863	1845	1568
Flt Permitted	0.95		0.52	1.00	1.00	1.00
Satd. Flow (perm)	1790		962	1863	1845	1568
Peak-hour factor, PHF	0.90	0.90	0.87	0.87	0.89	0.89
Adj. Flow (vph)	789	6	11	299	225	382
RTOR Reduction (vph)	1	0	0	0	0	74
Lane Group Flow (vph)	794	0	11	299	225	308
Heavy Vehicles (%)	1%	1%	2%	2%	3%	3%
Turn Type	Prot		pm+pt	NA	NA	custom
Protected Phases	8		1	6 7	2 7	7 8
Permitted Phases			6 7			2
Actuated Green, G (s)	41.2		27.3	26.4	27.3	70.5
Effective Green, g (s)	41.2		23.3	26.4	27.3	70.5
Actuated g/C Ratio	0.47		0.27	0.30	0.31	0.81
Clearance Time (s)	6.0		6.0			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap (vph)	843		264	562	576	1264
v/s Ratio Prot	c0.44		c0.00	c0.16	0.12	0.15
v/s Ratio Perm			0.01			0.05
v/c Ratio	0.94		0.04	0.53	0.39	0.24
Uniform Delay, d1	22.0		23.7	25.4	23.5	2.0
Progression Factor	1.00		1.00	1.00	1.13	0.18
Incremental Delay, d2	18.5		0.1	1.0	0.4	0.1
Delay (s)	40.4		23.8	26.3	27.0	0.5
Level of Service	D		C	C	C	A
Approach Delay (s)	40.4			26.2	10.3	
Approach LOS	D			C	B	

Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	87.4	Sum of lost time (s)	22.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	50	10	810	160	20	490
Future Volume (vph)	50	10	810	160	20	490
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0	4.0	6.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.97		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1762		1900	1615	1805	1900
Flt Permitted	0.96		1.00	1.00	0.22	1.00
Satd. Flow (perm)	1762		1900	1615	415	1900
Peak-hour factor, PHF	0.87	0.67	0.95	0.84	0.73	0.96
Adj. Flow (vph)	57	15	853	190	27	510
RTOR Reduction (vph)	10	0	0	41	0	0
Lane Group Flow (vph)	62	0	853	149	27	510
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Turn Type	Prot		NA	Perm	custom	NA
Protected Phases	7		6 8		5	2 8
Permitted Phases				6 8	2	
Actuated Green, G (s)	5.0		58.6	58.6	20.1	59.5
Effective Green, g (s)	5.0		58.6	58.6	20.1	59.5
Actuated g/C Ratio	0.06		0.67	0.67	0.23	0.68
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	3.0				3.0	
Lane Grp Cap (vph)	100		1273	1082	124	1293
v/s Ratio Prot	c0.03		c0.45		c0.00	0.27
v/s Ratio Perm				0.09	0.05	
v/c Ratio	0.62		0.67	0.14	0.22	0.39
Uniform Delay, d1	40.3		8.6	5.2	27.5	6.1
Progression Factor	1.00		0.35	0.52	1.00	1.00
Incremental Delay, d2	10.8		0.8	0.0	0.9	0.2
Delay (s)	51.0		3.9	2.8	28.4	6.3
Level of Service	D		A	A	C	A
Approach Delay (s)	51.0		3.7			7.4
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	87.4	Sum of lost time (s)	22.0
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	10	40	780	500	10
Future Volume (vph)	10	10	40	780	500	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.939				0.996	
Flt Protected	0.973		0.950			
Satd. Flow (prot)	1736	0	1787	1900	1874	0
Flt Permitted	0.973		0.950			
Satd. Flow (perm)	1736	0	1787	1900	1874	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	332			288	365	
Travel Time (s)	7.5			6.5	8.3	
Peak Hour Factor	0.64	0.77	0.71	0.90	0.75	0.55
Heavy Vehicles (%)	0%	0%	1%	0%	1%	0%
Adj. Flow (vph)	16	13	56	867	667	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	29	0	56	867	685	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 51.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.9

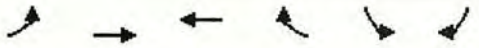
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	10	40	780	500	10
Future Vol, veh/h	10	10	40	780	500	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	64	77	71	90	75	55
Heavy Vehicles, %	0	0	1	0	1	0
Mvmt Flow	16	13	56	867	667	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1655	676	685	0	-	0
Stage 1	676	-	-	-	-	-
Stage 2	979	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	109	457	913	-	-	-
Stage 1	509	-	-	-	-	-
Stage 2	367	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	102	457	913	-	-	-
Mov Cap-2 Maneuver	102	-	-	-	-	-
Stage 1	478	-	-	-	-	-
Stage 2	367	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	32.8	0.6	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	913	-	158	-	-
HCM Lane V/C Ratio	0.062	-	0.181	-	-
HCM Control Delay (s)	9.2	-	32.8	-	-
HCM Lane LOS	A	-	D	-	-
HCM 95th %tile Q(veh)	0.2	-	0.6	-	-

APPENDIX R-3: ALTERNATIVE D INTERSECTION CAPACITY ANALYSES – SYNCHRO PRINTOUTS – AM PEAK HOUR



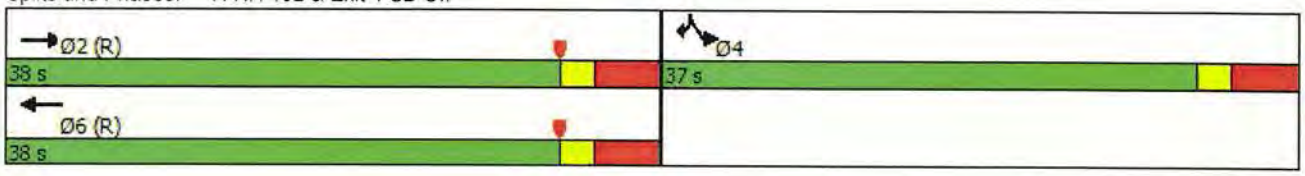
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 3 Extend (s)		0.0	0.0		0.0	0.0
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0		5.0	5.0
Minimum Split (s)		14.0	21.0		27.0	27.0
Total Split (s)		38.0	38.0		37.0	37.0
Total Split (%)		50.7%	50.7%		49.3%	49.3%
Maximum Green (s)		32.0	32.0		31.0	31.0
Yellow Time (s)		2.0	2.0		2.0	2.0
All-Red Time (s)		4.0	4.0		4.0	4.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		14.0	14.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		32.0	32.0		31.0	31.0
Actuated g/C Ratio		0.43	0.43		0.41	0.41
v/c Ratio		0.99	0.63		0.16	1.00
Control Delay		35.7	22.6		14.6	50.9
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		35.7	22.6		14.6	50.9
LOS		D	C		B	D
Approach Delay		35.7	22.6		47.1	
Approach LOS		D	C		D	
Queue Length 50th (ft)		340	424		37	282
Queue Length 95th (ft)		m#465	m409		69	#431
Internal Link Dist (ft)		632	308		132	
Turn Bay Length (ft)						
Base Capacity (vph)		1480	1453		797	1108
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.99	0.63		0.16	1.00

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.00

Intersection Signal Delay: 36.3 Intersection LOS: D
Intersection Capacity Utilization 68.7% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: NH 102 & Exit 4 SB Off



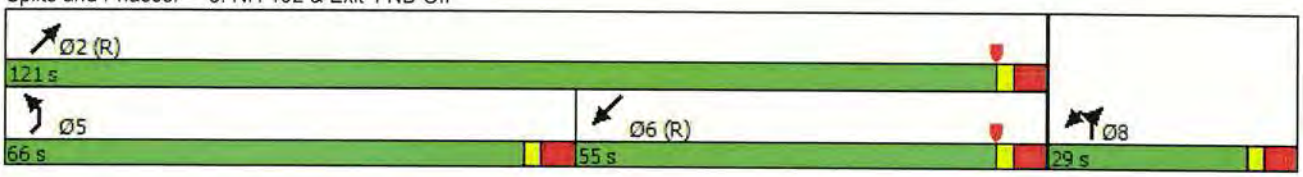
Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	455	0	330	0	0	1310	170	0	0	1080	360
Future Volume (vph)	455	0	330	0	0	1310	170	0	0	1080	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0	0	0	550		0	0		0
Storage Lanes		2	2	0	0	2		0	0		1
Taper Length (ft)		25		25		25			25		
Lane Util. Factor	0.97	1.00	0.88	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt			0.850								0.850
Flt Protected	0.950					0.950					
Satd. Flow (prot)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Flt Permitted	0.950					0.950					
Satd. Flow (perm)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Right Turn on Red			No					Yes			Yes
Satd. Flow (RTOR)											167
Link Speed (mph)		25		30			30			30	
Link Distance (ft)		856		390			760			857	
Travel Time (s)		23.3		8.9			17.3			19.5	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Adj. Flow (vph)	517	0	375	0	0	1394	181	0	0	1174	391
Shared Lane Traffic (%)											
Lane Group Flow (vph)	517	0	375	0	0	1394	181	0	0	1174	391
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		24		0			24			24	
Link Offset(ft)		12		0			0			0	
Crosswalk Width(ft)		16		16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	25	15	9	15		9	15		25
Number of Detectors	3		3			3	3			3	0
Detector Template											
Leading Detector (ft)	256		256			256	256			256	0
Trailing Detector (ft)	-5		-5			-5	-5			-5	0
Detector 1 Position(ft)	-5		-5			-5	-5			-5	-5
Detector 1 Size(ft)	55		55			55	55			55	50
Detector 1 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Queue (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Delay (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 2 Position(ft)	125		125			125	125			125	
Detector 2 Size(ft)	6		6			6	6			6	
Detector 2 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	
Detector 2 Channel											
Detector 2 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Detector 3 Position(ft)	250		250			250	250			250	
Detector 3 Size(ft)	6		6			6	6			6	

Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	
Detector 3 Channel											
Detector 3 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Detector Phase	8		2			5	2			6	
Switch Phase											
Minimum Initial (s)	10.0		10.0			5.0	8.0			8.0	
Minimum Split (s)	16.0		16.0			11.0	42.0			31.0	
Total Split (s)	29.0		29.0			66.0	121.0			55.0	
Total Split (%)	19.3%		19.3%			44.0%	80.7%			36.7%	
Maximum Green (s)	23.0		23.0			60.0	115.0			49.0	
Yellow Time (s)	2.0		2.0			2.0	2.0			2.0	
All-Red Time (s)	4.0		4.0			4.0	4.0			4.0	
Lost Time Adjust (s)	0.0		0.0			0.0	0.0			0.0	
Total Lost Time (s)	6.0		6.0			6.0	6.0			6.0	
Lead/Lag						Lead				Lag	
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Recall Mode	None		None			None	C-Min			C-Min	
Walk Time (s)							7.0			7.0	
Flash Dont Walk (s)							29.0			17.0	
Pedestrian Calls (#/hr)							0			0	
Act Effct Green (s)	23.0		23.0			60.0	115.0			49.0	150.0
Actuated g/C Ratio	0.15		0.15			0.40	0.77			0.33	1.00
v/c Ratio	1.04		0.93			1.04	0.07			1.03	0.25
Control Delay	111.4		92.5			56.7	7.5			82.5	0.4
Queue Delay	0.0		0.0			0.0	0.0			0.0	0.0
Total Delay	111.4		92.5			56.7	7.5			82.5	0.4
LOS	F		F			E	A			F	A
Approach Delay		103.4					51.1			62.0	
Approach LOS		F					D			E	
Queue Length 50th (ft)	~280		209			~738	30			~642	0
Queue Length 95th (ft)	#384		#305			m#763	m32			#782	0
Internal Link Dist (ft)		776		310			680			777	
Turn Bay Length (ft)						550					
Base Capacity (vph)	497		403			1334	2635			1144	1568
Starvation Cap Reductn	0		0			0	0			0	0
Spillback Cap Reductn	0		0			0	0			0	0
Storage Cap Reductn	0		0			0	0			0	0
Reduced v/c Ratio	1.04		0.93			1.04	0.07			1.03	0.25

Intersection Summary	
Area Type:	Other
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 6 (4%), Referenced to phase 2:NET and 6:SWT, Start of Yellow	
Natural Cycle: 150	

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 66.9 Intersection LOS: E
Intersection Capacity Utilization 96.2% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: NH 102 & Exit 4 NB Off



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	585	460	285	685	0	0	0	0	110	0	360
Future Volume (vph)	0	585	460	285	685	0	0	0	0	110	0	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		350	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3167	1417	1687	3374	0	0	0	0	3303	0	1524
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	3167	1417	1687	3374	0	0	0	0	3303	0	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			500									134
Link Speed (mph)		30			30			30			35	
Link Distance (ft)		851			693			486			581	
Travel Time (s)		19.3			15.8			11.0			11.3	
Peak Hour Factor	0.92	0.92	0.92	0.73	0.73	0.73	0.92	0.92	0.92	0.74	0.74	0.74
Heavy Vehicles (%)	14%	14%	14%	7%	7%	7%	2%	2%	2%	6%	6%	6%
Adj. Flow (vph)	0	636	500	390	938	0	0	0	0	149	0	486
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	636	500	390	938	0	0	0	0	149	0	486
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Right
Median Width(ft)		36			36			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		25	15		9	15		9	15		9
Number of Detectors		3	2	3	3					3		2
Detector Template		Thru	Right	Left	Thru					Left		
Leading Detector (ft)		256	131	256	256					256		206
Trailing Detector (ft)		-5	-5	-5	-5					-5		-5
Detector 1 Position(ft)		-5	-5	-5	-5					-5		-5
Detector 1 Size(ft)		50	50	50	50					50		50
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 2 Position(ft)		125	125	125	125					125		200
Detector 2 Size(ft)		6	6	6	6					6		6
Detector 2 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 3 Position(ft)		250		250	250					250		
Detector 3 Size(ft)		6		6	6					6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 3 Type		Cl+Ex		Cl+Ex	Cl+Ex					Cl+Ex		
Detector 3 Channel												
Detector 3 Extend (s)		0.0		0.0	0.0					0.0		
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Detector Phase		2		1	6					4		4
Switch Phase												
Minimum Initial (s)		9.0		4.0	9.0					4.0		4.0
Minimum Split (s)		21.0		10.0	21.0					10.0		10.0
Total Split (s)		34.0		37.0	71.0					39.0		39.0
Total Split (%)		30.9%		33.6%	64.5%					35.5%		35.5%
Maximum Green (s)		28.0		31.0	65.0					33.0		33.0
Yellow Time (s)		4.0		4.0	4.0					4.0		4.0
All-Red Time (s)		2.0		2.0	2.0					2.0		2.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0					6.0		6.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Recall Mode		C-Min		None	C-Min					None		None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		8.0			8.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)		32.1	110.0	28.8	66.9					31.1		31.1
Actuated g/C Ratio		0.29	1.00	0.26	0.61					0.28		0.28
v/c Ratio		0.69	0.35	0.88	0.46					0.16		0.92
Control Delay		40.5	0.7	34.3	1.4					29.4		52.0
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		40.5	0.7	34.3	1.4					29.4		52.0
LOS		D	A	C	A					C		D
Approach Delay		23.0			11.0						46.7	
Approach LOS		C			B						D	
Queue Length 50th (ft)		221	0	48	12					39		247
Queue Length 95th (ft)		290	0	m41	11					52		273
Internal Link Dist (ft)		771			613			406			501	
Turn Bay Length (ft)			350									
Base Capacity (vph)		925	1417	475	2051					990		551
Starvation Cap Reductn		0	0	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.69	0.35	0.82	0.46					0.15		0.88

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 61 (55%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 90

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 22.7 Intersection LOS: C
Intersection Capacity Utilization 71.4% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Exit 5 SB On/Exit 5 SB Off & NH 28

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	485	210	0	0	520	350	450	0	160	0	0	0
Future Volume (vph)	485	210	0	0	520	350	450	0	160	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1641	3282	0	0	3438	1538	1656	0	1482	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1641	3282	0	0	3438	1538	1656	0	1482	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						389			193			
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		693			542			867			392	
Travel Time (s)		15.8			12.3			16.9			8.9	
Peak Hour Factor	0.87	0.87	0.87	0.90	0.90	0.90	0.78	0.78	0.78	0.92	0.92	0.92
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	9%	9%	9%	2%	2%	2%
Adj. Flow (vph)	557	241	0	0	578	389	577	0	205	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	557	241	0	0	578	389	577	0	205	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Right	Right	Left	Right	Left	Left	Right
Median Width(ft)		36			42			12			12	
Link Offset(ft)		0			0			0			36	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		25	15		9	15		9
Number of Detectors	3	3			3	2	3		0			
Detector Template	Left	Thru			Thru	Right	Left					
Leading Detector (ft)	256	256			256	131	256		0			
Trailing Detector (ft)	-5	-5			-5	-5	-5		0			
Detector 1 Position(ft)	-5	-5			-5	-5	-5		-5			
Detector 1 Size(ft)	50	50			50	50	50		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 2 Position(ft)	125	125			125	125	125					
Detector 2 Size(ft)	6	6			6	6	6					
Detector 2 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex					
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0			0.0	0.0	0.0					
Detector 3 Position(ft)	250	250			250		250					
Detector 3 Size(ft)	6	6			6		6					
Detector 3 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex					
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0			0.0		0.0					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Detector Phase	5	2			6		8		8			
Switch Phase												
Minimum Initial (s)	4.0	16.0			16.0		4.0		4.0			
Minimum Split (s)	10.0	23.0			23.0		10.0		10.0			
Total Split (s)	42.0	67.0			25.0		43.0		43.0			
Total Split (%)	38.2%	60.9%			22.7%		39.1%		39.1%			
Maximum Green (s)	36.0	61.0			19.0		37.0		37.0			
Yellow Time (s)	4.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	2.0	2.0			2.0		2.0		2.0			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.0		6.0		6.0			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		10.0			10.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	36.0	61.0			19.0	110.0	37.0		37.0			
Actuated g/C Ratio	0.33	0.55			0.17	1.00	0.34		0.34			
v/c Ratio	1.04	0.13			0.97	0.25	1.04		0.33			
Control Delay	57.4	2.2			77.1	0.4	84.5		6.1			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	57.4	2.2			77.1	0.4	84.5		6.1			
LOS	E	A			E	A	F		A			
Approach Delay		40.7			46.3			63.9				
Approach LOS		D			D			E				
Queue Length 50th (ft)	~419	3			215	0	~440		6			
Queue Length 95th (ft)	#573	4			#331	0	#512		35			
Internal Link Dist (ft)		613			462			787			312	
Turn Bay Length (ft)												
Base Capacity (vph)	537	1820			593	1538	557		626			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.04	0.13			0.97	0.25	1.04		0.33			

Intersection Summary

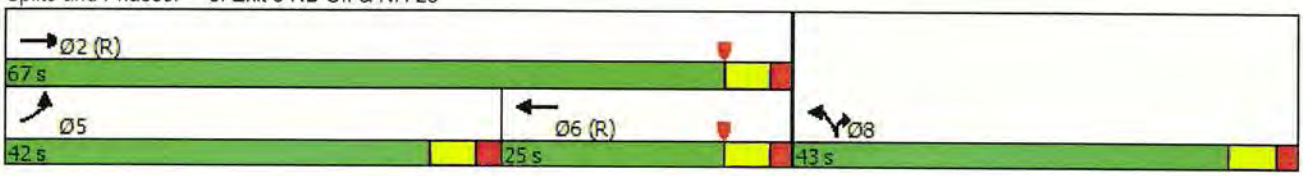
Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 50.0 Intersection LOS: D

Intersection Capacity Utilization 71.4% ICU Level of Service C
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Exit 5 NB Off & NH 28



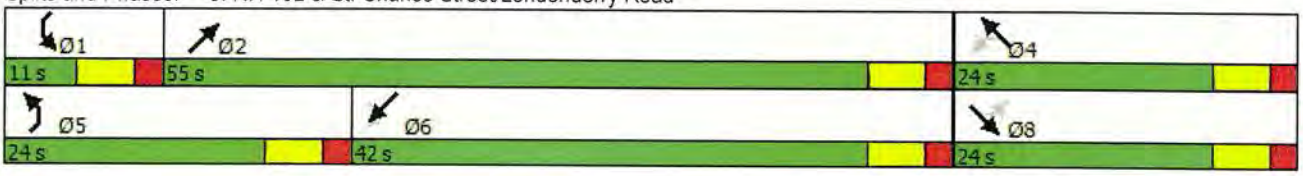
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	0	160	0	0	1	100	500	5	5	1110	30
Future Volume (vph)	10	0	160	0	0	1	100	500	5	5	1110	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		225	0		0	350		0	100		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.865			0.999			0.996	
Flt Protected		0.950					0.950			0.950		
Satd. Flow (prot)	0	1770	1583	0	1644	0	1770	3536	0	1770	3525	0
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	1863	1583	0	1644	0	1770	3536	0	1770	3525	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182		381			2			4	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		593			447			750			330	
Travel Time (s)		13.5			10.2			17.0			7.5	
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	11	0	174	0	0	4	109	543	5	5	1207	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	11	174	0	4	0	109	548	0	5	1240	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	3	1	3	1		3	3		3	3	
Detector Template	Left	Thru	Right	Left			Left	Thru		Left	Thru	
Leading Detector (ft)	256	256	45	256	45		256	256		256	256	
Trailing Detector (ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Position(ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	125	125		125			125	125		125	125	
Detector 2 Size(ft)	6	6		6			6	6		6	6	
Detector 2 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Detector 3 Position(ft)	250	250		250			250	250		250	250	
Detector 3 Size(ft)	6	6		6			6	6		6	6	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	custom		NA		Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Detector Phase	8	8	6	4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	8.0	5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		24.0	24.0		11.0	24.0	
Total Split (s)	24.0	24.0	42.0	24.0	24.0		24.0	55.0		11.0	42.0	
Total Split (%)	26.7%	26.7%	46.7%	26.7%	26.7%		26.7%	61.1%		12.2%	46.7%	
Maximum Green (s)	18.0	18.0	36.0	18.0	18.0		18.0	49.0		5.0	36.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lead/Lag			Lag				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	Min	None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0			0	
Act Effct Green (s)		6.3	42.7		6.0		9.3	57.0		5.1	42.7	
Actuated g/C Ratio		0.10	0.69		0.10		0.15	0.92		0.08	0.69	
v/c Ratio		0.06	0.15		0.01		0.41	0.17		0.03	0.51	
Control Delay		27.9	1.9		0.0		29.7	2.3		29.8	8.8	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		27.9	1.9		0.0		29.7	2.3		29.8	8.8	
LOS		C	A		A		C	A		C	A	
Approach Delay		3.5						6.9			8.9	
Approach LOS		A						A			A	
Queue Length 50th (ft)		3	0		0		34	0		2	104	
Queue Length 95th (ft)		19	27		0		89	82		13	305	
Internal Link Dist (ft)		513			367			670			250	
Turn Bay Length (ft)			225				350			100		
Base Capacity (vph)		552	1146		755		524	3276		145	2428	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.02	0.15		0.01		0.21	0.17		0.03	0.51	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 62	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	

Maximum v/c Ratio: 0.51
Intersection Signal Delay: 7.8 Intersection LOS: A
Intersection Capacity Utilization 64.5% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 9: NH 102 & St. Charles Street/Londonderry Road



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	20	10	350	0	30	0	420	110	15	585	0
Future Volume (vph)	10	20	10	350	0	30	0	420	110	15	585	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.966			0.989			0.972				
Flt Protected		0.987			0.956						0.999	
Satd. Flow (prot)	0	1776	0	0	1744	0	0	1710	0	0	1808	0
Flt Permitted		0.874			0.694						0.981	
Satd. Flow (perm)	0	1573	0	0	1266	0	0	1710	0	0	1775	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			36			21				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		356			493			1124			603	
Travel Time (s)		8.1			11.2			25.5			13.7	
Peak Hour Factor	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Adj. Flow (vph)	17	33	17	365	0	31	0	472	124	17	680	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	67	0	0	396	0	0	596	0	0	697	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		-22			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	1		3	2			2		3	2	
Detector Template	Left			Left						Left		
Leading Detector (ft)	256	45		256	131			131		256	131	
Trailing Detector (ft)	-5	-5		-5	-5			-5		-5	-5	
Detector 1 Position(ft)	-5	-5		-5	-5			-5		-5	-5	
Detector 1 Size(ft)	50	50		50	50			50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 2 Position(ft)	125			125	125			125		125	125	
Detector 2 Size(ft)	6			6	6			6		6	6	
Detector 2 Type	Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0	0.0			0.0		0.0	0.0	
Detector 3 Position(ft)	250			250						250		
Detector 3 Size(ft)	6			6						6		
Detector 3 Type	Cl+Ex			Cl+Ex						Cl+Ex		
Detector 3 Channel												
Detector 3 Extend (s)	0.0			0.0						0.0		

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Detector Phase	4	4		4	4			2		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0			24.0		24.0	24.0	
Total Split (s)	39.0	39.0		39.0	39.0			51.0		51.0	51.0	
Total Split (%)	43.3%	43.3%		43.3%	43.3%			56.7%		56.7%	56.7%	
Maximum Green (s)	33.0	33.0		33.0	33.0			45.0		45.0	45.0	
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Recall Mode	None	None		None	None			Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		27.3			27.3			38.5			38.5	
Actuated g/C Ratio		0.35			0.35			0.49			0.49	
v/c Ratio		0.12			0.85			0.70			0.80	
Control Delay		15.4			41.6			21.0			26.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		15.4			41.6			21.0			26.0	
LOS		B			D			C			C	
Approach Delay		15.4			41.6			21.0			26.0	
Approach LOS		B			D			C			C	
Queue Length 50th (ft)		18			183			238			311	
Queue Length 95th (ft)		28			#345			356			428	
Internal Link Dist (ft)		276			413			1044			523	
Turn Bay Length (ft)												
Base Capacity (vph)		706			581			1041			1072	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.09			0.68			0.57			0.65	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 78.4
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 27.4 Intersection LOS: C
Intersection Capacity Utilization 82.1% ICU Level of Service E

Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: NH 102 & Fordway/Madden Hill Road

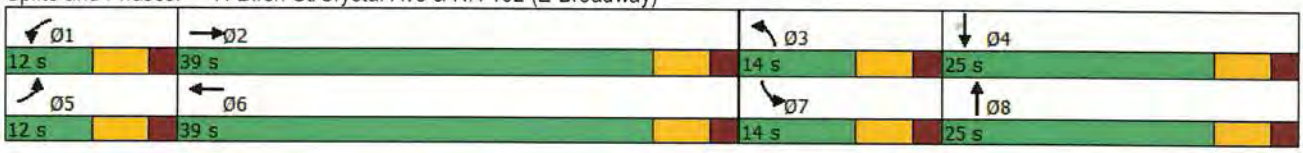
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	200	90	20	520	60	60	290	30	70	240	30
Future Volume (vph)	80	200	90	20	520	60	60	290	30	70	240	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	390		0	110		0	70		0	245		245
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.953			0.984			0.986				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1661	0	1703	1764	0	1719	1784	0	1703	1792	1524
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1656	1661	0	1703	1764	0	1719	1784	0	1703	1792	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			7			5				182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		505			530			361			411	
Travel Time (s)		11.5			12.0			8.2			9.3	
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.91	0.91	0.91
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	5%	5%	5%	6%	6%	6%
Parking (#/hr)			0									
Adj. Flow (vph)	83	208	94	21	553	64	71	341	35	77	264	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	302	0	21	617	0	71	376	0	77	264	33
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Detector Phase	5	2		1	6		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	10.0		4.0	10.0		4.0	9.0	9.0
Minimum Split (s)	10.0	30.0		10.0	30.0		10.0	25.0		10.0	25.0	25.0
Total Split (s)	12.0	39.0		12.0	39.0		14.0	25.0		14.0	25.0	25.0
Total Split (%)	13.3%	43.3%		13.3%	43.3%		15.6%	27.8%		15.6%	27.8%	27.8%
Maximum Green (s)	6.0	33.0		6.0	33.0		8.0	19.0		8.0	19.0	19.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Min		None	Min		Min	None		Min	None	None
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)		10			10			0			10	10
Act Effct Green (s)	6.1	36.0		5.9	31.5		7.4	19.3		7.5	19.3	19.3
Actuated g/C Ratio	0.07	0.42		0.07	0.37		0.09	0.23		0.09	0.23	0.23
v/c Ratio	0.71	0.42		0.18	0.94		0.48	0.93		0.52	0.65	0.07
Control Delay	74.1	19.0		43.5	52.4		50.4	66.0		52.2	40.8	0.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	74.1	19.0		43.5	52.4		50.4	66.0		52.2	40.8	0.3
LOS	E	B		D	D		D	E		D	D	A
Approach Delay		30.9			52.1			63.6			39.6	
Approach LOS		C			D			E			D	
Queue Length 50th (ft)	47	89		12	332		39	212		43	140	0
Queue Length 95th (ft)	#125	193		35	#554		77	#360		87	#240	0
Internal Link Dist (ft)		425			450			281			331	
Turn Bay Length (ft)	390			110			70			245		245
Base Capacity (vph)	117	753		120	693		162	404		161	404	485
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.71	0.40		0.17	0.89		0.44	0.93		0.48	0.65	0.07

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 85.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 47.9 Intersection LOS: D
Intersection Capacity Utilization 76.4% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Birch St/Crystal Ave & NH 102 (E Broadway)



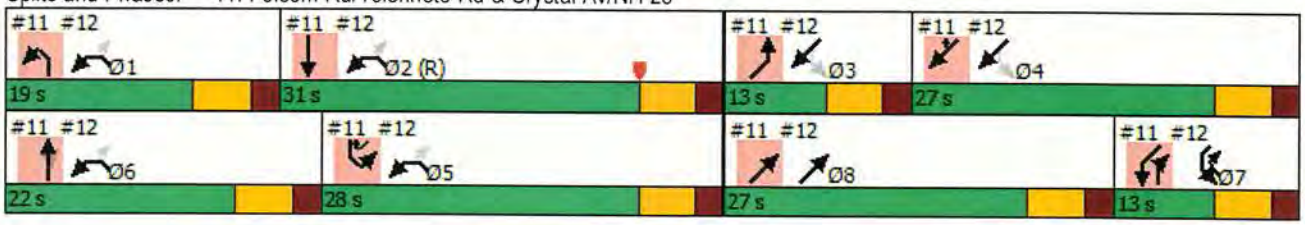
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	200	140	590	190	0	160	220	30	30	310	770
Future Volume (vph)	20	200	140	590	190	0	160	220	30	30	310	770
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80		180	525		190	200		200	160		0
Storage Lanes	1		1	2		0	2		1	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	1.00	1.00	0.88
Frt			0.850						0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	3471	1553	3335	3438	0	3400	1845	1568	1752	1845	2760
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	3471	1553	3335	3438	0	3400	1845	1568	1752	1845	2760
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182						327			243
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		639			723			532			387	
Travel Time (s)		14.5			16.4			12.1			8.8	
Peak Hour Factor	0.84	0.84	0.84	0.79	0.79	0.79	0.86	0.86	0.86	0.99	0.99	0.99
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	24	238	167	747	241	0	186	256	35	30	313	778
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	238	167	747	241	0	186	256	35	30	313	778
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	1	6	7	5	2		3	8		7	4	4 5
Permitted Phases		6	6		2			8	Free		4	
Detector Phase	1	6	7	5	2		3	8		7	4	4 5
Switch Phase												
Minimum Initial (s)	8.0	5.0	7.0	7.0	5.0		7.0	5.0		7.0	5.0	
Minimum Split (s)	14.0	20.0	13.0	13.0	20.0		13.0	20.0		13.0	20.0	
Total Split (s)	19.0	22.0	13.0	28.0	31.0		13.0	27.0		13.0	27.0	
Total Split (%)	21.1%	24.4%	14.4%	31.1%	34.4%		14.4%	30.0%		14.4%	30.0%	
Maximum Green (s)	13.0	16.0	7.0	22.0	25.0		7.0	21.0		7.0	21.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lead	Lag	Lag	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	C-Max		None	None		None	None	
Act Effct Green (s)	12.7	15.1	28.6	22.9	25.3		7.0	20.5	90.0	7.5	21.0	43.9
Actuated g/C Ratio	0.14	0.17	0.32	0.25	0.28		0.08	0.23	1.00	0.08	0.23	0.49
v/c Ratio	0.10	0.41	0.27	0.88	0.25		0.70	0.61	0.02	0.21	0.73	0.53
Control Delay	34.6	35.5	4.2	42.6	23.1		56.0	38.1	0.0	30.9	29.0	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.6	35.5	4.2	42.6	23.1		56.0	38.1	0.0	30.9	29.0	4.3
LOS	C	D	A	D	C		E	D	A	C	C	A
Approach Delay		23.3			37.8			42.3			11.9	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		C			D			D			B	
Queue Length 50th (ft)	12	63	0	217	46		54	130	0	14	100	30
Queue Length 95th (ft)	32	92	28	#212	74		#92	198	0	m22	m196	75
Internal Link Dist (ft)		559			643			452			307	
Turn Bay Length (ft)	80		180	525			200		200	160		
Base Capacity (vph)	250	617	617	850	966		264	430	1568	146	430	1471
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	27
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.39	0.27	0.88	0.25		0.70	0.60	0.02	0.21	0.73	0.54

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 38 (42%), Referenced to phase 2:SBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 26.8 Intersection LOS: C
Intersection Capacity Utilization 64.5% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Folsom Rd/Tsienneto Rd & Crystal Av/NH 28



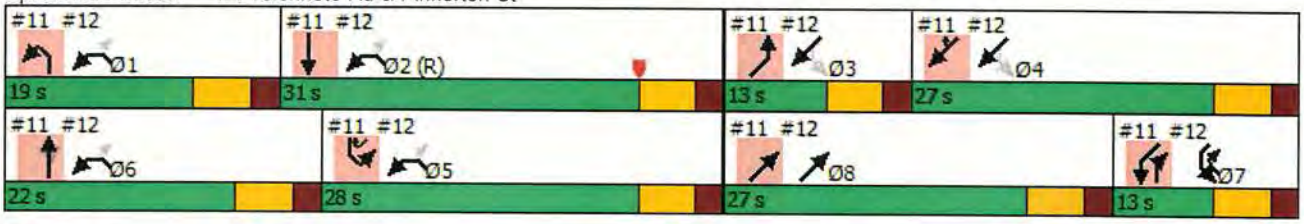
Lane Group	NWL	NWR	NET	NER	SWL	SWT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6
Lane Configurations												
Traffic Volume (vph)	300	70	580	370	60	810						
Future Volume (vph)	300	70	580	370	60	810						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900						
Storage Length (ft)	90	0		0	175							
Storage Lanes	1	1		1	1							
Taper Length (ft)	25				25							
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95						
Frt		0.850		0.850								
Flt Protected	0.950				0.950							
Satd. Flow (prot)	1770	1583	3505	1568	1770	3539						
Flt Permitted	0.950				0.230							
Satd. Flow (perm)	1770	1583	3505	1568	428	3539						
Right Turn on Red		Yes		Yes								
Satd. Flow (RTOR)		21		430								
Link Speed (mph)	30		30			30						
Link Distance (ft)	408		387			258						
Travel Time (s)	9.3		8.8			5.9						
Peak Hour Factor	0.83	0.83	0.86	0.86	0.81	0.81						
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%						
Adj. Flow (vph)	361	84	674	430	74	1000						
Shared Lane Traffic (%)												
Lane Group Flow (vph)	361	84	674	430	74	1000						
Turn Type	Prot	pm+ov	NA	Free	pm+pt	NA						
Protected Phases	1 2 5 6	7	8		7	3 4	1	2	3	4	5	6
Permitted Phases		1 2 5 6		Free	3 4							
Detector Phase	1 2 5 6	7	8		7	3 4						
Switch Phase												
Minimum Initial (s)		7.0	5.0		7.0		8.0	5.0	7.0	5.0	7.0	5.0
Minimum Split (s)		13.0	20.0		13.0		14.0	20.0	13.0	20.0	13.0	20.0
Total Split (s)		13.0	27.0		13.0		19.0	31.0	13.0	27.0	28.0	22.0
Total Split (%)		14.4%	30.0%		14.4%		21%	34%	14%	30%	31%	24%
Maximum Green (s)		7.0	21.0		7.0		13.0	25.0	7.0	21.0	22.0	16.0
Yellow Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		2.0	2.0		2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0							
Total Lost Time (s)		6.0	6.0		6.0							
Lead/Lag		Lag	Lead		Lag		Lead	Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize?		Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode		None	None		None		None	C-Max	None	None	None	None
Act Effct Green (s)	41.6	55.1	20.5	90.0	34.0	34.0						
Actuated g/C Ratio	0.46	0.61	0.23	1.00	0.38	0.38						
v/c Ratio	0.44	0.09	0.85	0.27	0.27	0.75						
Control Delay	17.0	5.2	27.4	0.4	25.8	28.6						
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0						
Total Delay	17.0	5.2	27.4	0.4	25.8	28.6						
LOS	B	A	C	A	C	C						
Approach Delay	14.8		16.9			28.4						

Lane Group	NWL	NWR	NET	NER	SWL	SWT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6
Approach LOS	B		B			C						
Queue Length 50th (ft)	126	12	173	0	27	254						
Queue Length 95th (ft)	175	26	m227	m0	50	282						
Internal Link Dist (ft)	328		307			178						
Turn Bay Length (ft)	90				175							
Base Capacity (vph)	812	977	817	1568	274	1336						
Starvation Cap Reductn	0	0	0	0	0	0						
Spillback Cap Reductn	0	0	0	0	0	0						
Storage Cap Reductn	0	0	0	0	0	0						
Reduced v/c Ratio	0.44	0.09	0.82	0.27	0.27	0.75						

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 38 (42%), Referenced to phase 2:SBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 21.2 Intersection LOS: C
Intersection Capacity Utilization 53.5% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 12: Tsienneto Rd & Pinkerton St



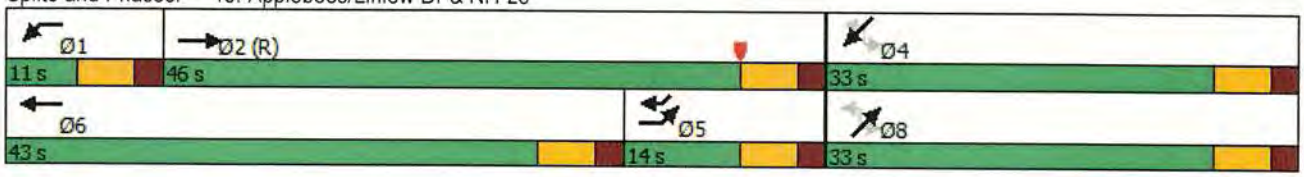
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	160	980	0	0	980	50	5	0	5	20	0	180
Future Volume (vph)	160	980	0	0	980	50	5	0	5	20	0	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	115		150	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.993				0.850			0.850
Flt Protected	0.950							0.950			0.950	
Satd. Flow (prot)	1687	3374	0	1863	3514	0	0	1805	1615	0	1787	1599
Flt Permitted	0.950											
Satd. Flow (perm)	1687	3374	0	1863	3514	0	0	1900	1615	0	1881	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					7				182			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		463			420			218			433	
Travel Time (s)		10.5			9.5			5.0			9.8	
Peak Hour Factor	0.83	0.83	0.83	0.92	0.92	0.92	0.50	0.50	0.50	0.90	0.90	0.90
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	193	1181	0	0	1065	54	10	0	10	22	0	200
Shared Lane Traffic (%)												
Lane Group Flow (vph)	193	1181	0	0	1119	0	0	10	10	0	22	200
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases					6		8	8	8	4		4
Detector Phase	5	2		1	6		8	8	8	4	4	5
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		5.0	5.0	5.0	5.0	5.0	8.0
Minimum Split (s)	14.0	46.0		11.0	43.0		33.0	33.0	33.0	33.0	33.0	14.0
Total Split (s)	14.0	46.0		11.0	43.0		33.0	33.0	33.0	33.0	33.0	14.0
Total Split (%)	15.6%	51.1%		12.2%	47.8%		36.7%	36.7%	36.7%	36.7%	36.7%	15.6%
Maximum Green (s)	8.0	40.0		5.0	37.0		27.0	27.0	27.0	27.0	27.0	8.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lead/Lag	Lag	Lag		Lead	Lead							Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
Act Effct Green (s)	18.9	81.8			53.3			6.8	6.8		7.0	24.7
Actuated g/C Ratio	0.21	0.91			0.59			0.08	0.08		0.08	0.27
v/c Ratio	0.55	0.39			0.54			0.07	0.03		0.15	0.39
Control Delay	41.6	4.0			17.0			38.6	0.2		40.2	14.9
Queue Delay	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Delay	41.6	4.0			17.0			38.6	0.2		40.2	14.9
LOS	D	A			B			D	A		D	B
Approach Delay		9.3			17.0			19.4			17.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		A			B			B			B	
Queue Length 50th (ft)	94	0			244			6	0		12	41
Queue Length 95th (ft)	#242	274			283			12	0		34	101
Internal Link Dist (ft)		383			340			138			353	
Turn Bay Length (ft)	300											
Base Capacity (vph)	353	3066			2085			570	611		564	517
Starvation Cap Reductn	0	0			0			0	0		0	0
Spillback Cap Reductn	0	0			0			0	0		0	0
Storage Cap Reductn	0	0			0			0	0		0	0
Reduced v/c Ratio	0.55	0.39			0.54			0.02	0.02		0.04	0.39

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 14 (16%), Referenced to phase 2:EBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 13.2 Intersection LOS: B
Intersection Capacity Utilization 60.3% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: Applebees/Linlew Dr & NH 28



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	990	20	5	940	340	10	5	5	110	5	180
Future Volume (vph)	140	990	20	5	940	340	10	5	5	110	5	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		150	205		150	0		0	325		150
Storage Lanes	2		0	1		1	1		0	1		1
Taper Length (ft)	200			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.997				0.850		0.925				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.957	
Satd. Flow (prot)	3303	3395	0	1736	3471	1553	1805	1758	0	1665	1677	1568
Flt Permitted	0.950			0.950			0.950			0.950	0.000	
Satd. Flow (perm)	3303	3395	0	1736	3471	1553	1805	1758	0	1665	0	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				351		7				182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		412			486			151			446	
Travel Time (s)		9.4			11.0			3.4			10.1	
Peak Hour Factor	0.83	0.83	0.83	0.97	0.97	0.97	0.67	0.67	0.67	0.90	0.90	0.90
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Adj. Flow (vph)	169	1193	24	5	969	351	15	7	7	122	6	200
Shared Lane Traffic (%)										48%		
Lane Group Flow (vph)	169	1217	0	5	969	351	15	14	0	63	65	200
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	pt+ov
Protected Phases	5	2		1	6	7	3	8		7	4	4 5
Permitted Phases						6		8				
Detector Phase	5	2		1	6	7	3	8		7	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0	8.0	5.0	5.0		8.0	8.0	
Minimum Split (s)	11.0	14.0		11.0	14.0	14.0	11.0	11.0		14.0	14.0	
Total Split (s)	15.0	52.0		11.0	48.0	16.0	15.0	11.0		16.0	12.0	
Total Split (%)	16.7%	57.8%		12.2%	53.3%	17.8%	16.7%	12.2%		17.8%	13.3%	
Maximum Green (s)	9.0	46.0		5.0	42.0	10.0	9.0	5.0		10.0	6.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Min		None	Min	None	None	None		None	None	
Act Effct Green (s)	9.2	65.0		5.6	52.0	65.4	6.3	5.6		8.6	8.6	23.3
Actuated g/C Ratio	0.10	0.72		0.06	0.58	0.73	0.07	0.06		0.10	0.10	0.26
v/c Ratio	0.50	0.50		0.05	0.48	0.29	0.12	0.12		0.40	0.41	0.37
Control Delay	43.5	8.1		44.0	11.8	4.2	40.8	31.7		45.8	46.1	7.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	43.5	8.1		44.0	11.8	4.2	40.8	31.7		45.8	46.1	7.7
LOS	D	A		D	B	A	D	C		D	D	A
Approach Delay		12.4			9.9			36.4			22.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A			D			C	
Queue Length 50th (ft)	47	96		3	231	80	8	4		36	37	8
Queue Length 95th (ft)	73	296		m6	310	101	20	16		76	78	61
Internal Link Dist (ft)		332			406			71			366	
Turn Bay Length (ft)	200			205		150				325		150
Base Capacity (vph)	354	2452		107	2004	1242	180	116		185	160	547
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.48	0.50		0.05	0.48	0.28	0.08	0.12		0.34	0.41	0.37

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 25 (28%), Referenced to phase 2:EBT, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.50
Intersection Signal Delay: 12.6 Intersection LOS: B
Intersection Capacity Utilization 57.0% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: VIP Dr/Ashleigh Dr & NH 28

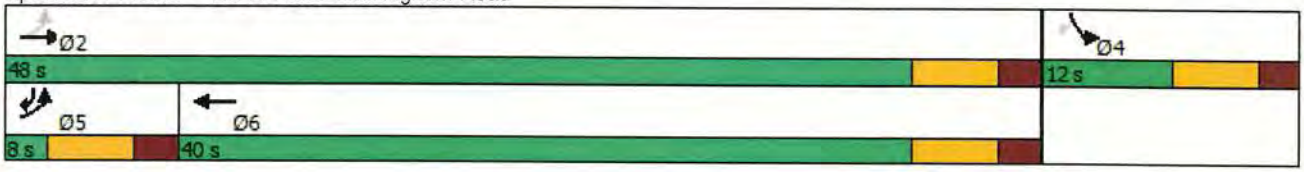
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	55	1630	1560	210	90	105
Future Volume (vph)	55	1630	1560	210	90	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			0	360	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.982			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3476	0	1770	1583
Flt Permitted	0.099				0.950	
Satd. Flow (perm)	184	3539	3476	0	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			40			18
Link Speed (mph)		30	30		30	
Link Distance (ft)		463	580		704	
Travel Time (s)		10.5	13.2		16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	1772	1696	228	98	114
Shared Lane Traffic (%)						
Lane Group Flow (vph)	60	1772	1924	0	98	114
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Detector Phase	5	2	6		4	5
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	11.0	20.0	20.0		11.0	11.0
Total Split (s)	8.0	48.0	40.0		12.0	8.0
Total Split (%)	13.3%	80.0%	66.7%		20.0%	13.3%
Maximum Green (s)	2.0	42.0	34.0		6.0	2.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	None		None	None
Act Effct Green (s)	40.3	42.1	36.2		6.1	10.9
Actuated g/C Ratio	0.73	0.76	0.65		0.11	0.20
v/c Ratio	0.31	0.66	0.84		0.50	0.35
Control Delay	7.0	6.4	16.8		36.5	19.9
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	7.0	6.4	16.8		36.5	19.9
LOS	A	A	B		D	B
Approach Delay		6.4	16.8		27.6	
Approach LOS		A	B		C	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 50th (ft)	5	156	306		35	28
Queue Length 95th (ft)	13	220	#508		#88	66
Internal Link Dist (ft)		383	500		624	
Turn Bay Length (ft)	200				360	
Base Capacity (vph)	193	2689	2232		199	327
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.31	0.66	0.86		0.49	0.35

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 55.4
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 12.6 — Intersection LOS: B
Intersection Capacity Utilization 66.3% — ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 25: NH 28 & Rockingham Road



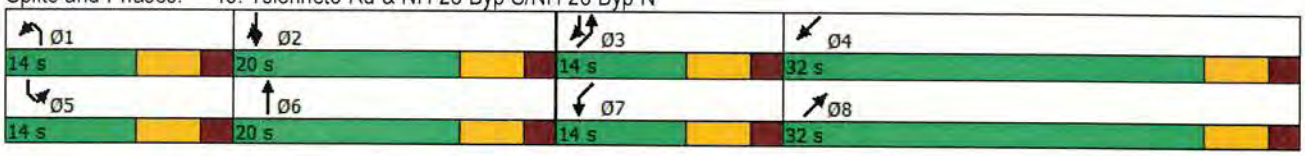
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	50	20	80	40	200	40	310	70	70	570	50
Future Volume (vph)	30	50	20	80	40	200	40	310	70	70	570	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	145		110	280		280	360		0	120		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.958				0.850		0.972			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1767	0	1736	1827	1553	1770	3440	0	1787	3531	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1767	0	1736	1827	1553	1770	3440	0	1787	3531	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21				201		36			12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		481			484			479			371	
Travel Time (s)		10.9			11.0			10.9			8.4	
Peak Hour Factor	0.82	0.82	0.82	0.81	0.81	0.81	0.68	0.68	0.68	0.78	0.78	0.78
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	37	61	24	99	49	247	59	456	103	90	731	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	85	0	99	49	247	59	559	0	90	795	0
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases												
Detector Phase	1	6		5	2	2 3	3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	20.0		14.0	20.0		14.0	20.0		14.0	20.0	
Total Split (s)	14.0	20.0		14.0	20.0		14.0	32.0		14.0	32.0	
Total Split (%)	17.5%	25.0%		17.5%	25.0%		17.5%	40.0%		17.5%	40.0%	
Maximum Green (s)	8.0	14.0		8.0	14.0		8.0	26.0		8.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	Max		None	None		None	None	
Act Effct Green (s)	8.2	13.0		8.2	16.0	30.4	8.2	25.6		8.2	21.8	
Actuated g/C Ratio	0.11	0.18		0.11	0.22	0.42	0.11	0.36		0.11	0.30	
v/c Ratio	0.19	0.25		0.50	0.12	0.32	0.29	0.45		0.45	0.74	
Control Delay	35.1	24.7		43.6	27.9	6.2	37.1	20.1		40.9	27.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	35.1	24.7		43.6	27.9	6.2	37.1	20.1		40.9	27.3	
LOS	D	C		D	C	A	D	C		D	C	
Approach Delay		27.9			18.3			21.7			28.7	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	17	27		47	20	15	27	108		43	176	
Queue Length 95th (ft)	41	59		86	45	49	48	108		76	197	
Internal Link Dist (ft)		401			404			399			291	
Turn Bay Length (ft)	145			280		280	360			120		
Base Capacity (vph)	199	367		197	406	770	201	1320		202	1310	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.19	0.23		0.50	0.12	0.32	0.29	0.42		0.45	0.61	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 72.1
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 24.5 — Intersection LOS: C
Intersection Capacity Utilization 51.4% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 18: Tsienneto Rd & NH 28 Byp S/NH 28 Byp N

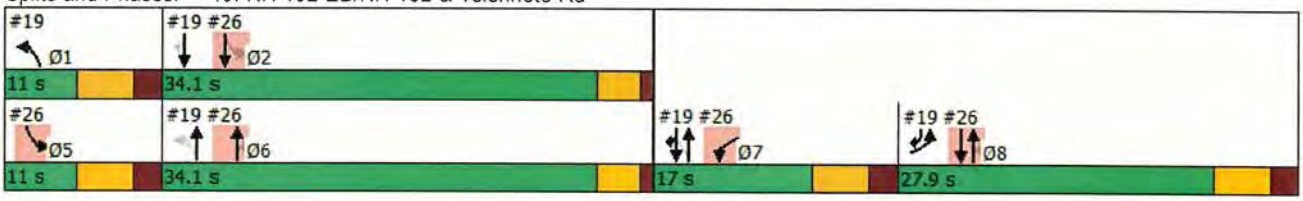


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø2	Ø5	Ø6	Ø7
Lane Configurations										
Traffic Volume (vph)	240	0	10	120	260	520				
Future Volume (vph)	240	0	10	120	260	520				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	200	0	100			90				
Storage Lanes	0	0	1			1				
Taper Length (ft)	25		25							
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Frt						0.850				
Flt Protected	0.950		0.950							
Satd. Flow (prot)	1787	0	1770	1863	1845	1568				
Flt Permitted	0.950		0.498							
Satd. Flow (perm)	1787	0	928	1863	1845	1568				
Right Turn on Red		Yes				Yes				
Satd. Flow (RTOR)						584				
Link Speed (mph)	30			30	30					
Link Distance (ft)	392			704	263					
Travel Time (s)	8.9			16.0	6.0					
Peak Hour Factor	0.90	0.90	0.87	0.87	0.89	0.89				
Heavy Vehicles (%)	1%	1%	2%	2%	3%	3%				
Adj. Flow (vph)	267	0	11	138	292	584				
Shared Lane Traffic (%)										
Lane Group Flow (vph)	267	0	11	138	292	584				
Turn Type	Prot		pm+pt	NA	NA	custom				
Protected Phases	8		1	6 7	2 7	7 8	2	5	6	7
Permitted Phases			6 7			2				
Detector Phase	8		1	6 7	2 7	7 8				
Switch Phase										
Minimum Initial (s)	5.0		5.0				5.0	5.0	5.0	5.0
Minimum Split (s)	26.5		11.0				9.0	11.0	9.0	11.0
Total Split (s)	27.9		11.0				34.1	11.0	34.1	17.0
Total Split (%)	31.0%		12.2%				38%	12%	38%	19%
Maximum Green (s)	21.9		5.0				30.1	5.0	30.1	11.0
Yellow Time (s)	4.0		4.0				3.0	4.0	3.0	4.0
All-Red Time (s)	2.0		2.0				1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0		0.0							
Total Lost Time (s)	6.0		6.0							
Lead/Lag	Lag		Lead				Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes		Yes				Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0		3.0				3.0	3.0	3.0	3.0
Recall Mode	None		None				Min	None	Min	None
Act Effct Green (s)	22.0		32.4	33.7	33.7	65.1				
Actuated g/C Ratio	0.32		0.48	0.50	0.50	0.96				
v/c Ratio	0.46		0.02	0.15	0.32	0.38				
Control Delay	24.4		7.7	9.9	11.7	0.8				
Queue Delay	0.0		0.0	0.0	1.0	0.1				
Total Delay	24.4		7.7	9.9	12.7	0.9				
LOS	C		A	A	B	A				
Approach Delay	24.4			9.7	4.8					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø2	Ø5	Ø6	Ø7
Approach LOS	C			A	A					
Queue Length 50th (ft)	82		2	27	81	0				
Queue Length 95th (ft)	217		8	66	122	19				
Internal Link Dist (ft)	312			624	183					
Turn Bay Length (ft)	200		100			90				
Base Capacity (vph)	595		508	985	975	1494				
Starvation Cap Reductn	0		0	0	449	142				
Spillback Cap Reductn	0		0	0	0	0				
Storage Cap Reductn	0		0	0	0	0				
Reduced v/c Ratio	0.45		0.02	0.14	0.56	0.43				

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 67.7			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 9.4		Intersection LOS: A	
Intersection Capacity Utilization 46.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 19: NH 102 EB/NH 102 & Tsienneto Rd



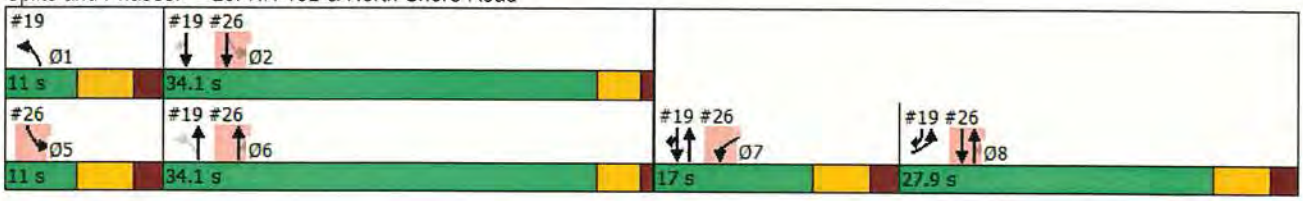
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø1	Ø2	Ø6	Ø8
Lane Configurations										
Traffic Volume (vph)	60	10	330	30	10	720				
Future Volume (vph)	60	10	330	30	10	720				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	0	0		90	100					
Storage Lanes	1	0		1	1					
Taper Length (ft)	25				25					
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Frt	0.976			0.850						
Flt Protected	0.961				0.950					
Satd. Flow (prot)	1768	0	1900	1615	1805	1900				
Flt Permitted	0.961				0.432					
Satd. Flow (perm)	1768	0	1900	1615	821	1900				
Right Turn on Red		Yes		Yes						
Satd. Flow (RTOR)	10			36						
Link Speed (mph)	30		30			30				
Link Distance (ft)	524		263			288				
Travel Time (s)	11.9		6.0			6.5				
Peak Hour Factor	0.87	0.67	0.95	0.84	0.73	0.96				
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%				
Adj. Flow (vph)	69	15	347	36	14	750				
Shared Lane Traffic (%)										
Lane Group Flow (vph)	84	0	347	36	14	750				
Turn Type	Prot		NA	Perm	custom	NA				
Protected Phases	7		6 8		5	2 8	1	2	6	8
Permitted Phases				6 8	2					
Detector Phase	7		6 8	6 8	5	2 8				
Switch Phase										
Minimum Initial (s)	5.0				5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	11.0				11.0		11.0	9.0	9.0	26.5
Total Split (s)	17.0				11.0		11.0	34.1	34.1	27.9
Total Split (%)	18.9%				12.2%		12%	38%	38%	31%
Maximum Green (s)	11.0				5.0		5.0	30.1	30.1	21.9
Yellow Time (s)	4.0				4.0		4.0	3.0	3.0	4.0
All-Red Time (s)	2.0				2.0		2.0	1.0	1.0	2.0
Lost Time Adjust (s)	0.0				0.0					
Total Lost Time (s)	6.0				6.0					
Lead/Lag	Lead				Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes				Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0				3.0		3.0	3.0	3.0	3.0
Recall Mode	None				None		None	Min	Min	None
Act Effct Green (s)	10.0		45.2	45.2	16.2	45.2				
Actuated g/C Ratio	0.15		0.67	0.67	0.24	0.67				
v/c Ratio	0.31		0.27	0.03	0.05	0.59				
Control Delay	29.9		1.9	0.2	17.5	7.8				
Queue Delay	0.0		0.1	0.0	0.0	0.0				
Total Delay	29.9		2.0	0.2	17.5	7.8				
LOS	C		A	A	B	A				
Approach Delay	29.9		1.9			8.0				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø1	Ø2	Ø6	Ø8
Approach LOS	C		A			A				
Queue Length 50th (ft)	26		13	0	4	129				
Queue Length 95th (ft)	81		21	m0	12	191				
Internal Link Dist (ft)	444		183			208				
Turn Bay Length (ft)				90	100					
Base Capacity (vph)	304		1608	1372	271	1608				
Starvation Cap Reductn	0		460	0	0	0				
Spillback Cap Reductn	0		0	0	0	0				
Storage Cap Reductn	0		0	0	0	0				
Reduced v/c Ratio	0.28		0.30	0.03	0.05	0.47				

Intersection Summary

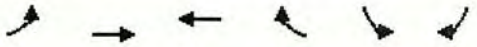
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 67.7
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.59
Intersection Signal Delay: 7.6 — Intersection LOS: A
Intersection Capacity Utilization 50.4% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 26: NH 102 & North Shore Road



APPENDIX R-4: ALTERNATIVE D INTERSECTION CAPACITY ANALYSES – SYNCHRO PRINTOUTS – PM PEAK HOUR

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1285	1405	0	125	1295
Future Volume (vph)	0	1285	1405	0	125	1295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.88
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3471	3406	0	1930	2682
Flt Permitted					0.950	
Satd. Flow (perm)	0	3471	3406	0	1930	2682
Right Turn on Red				Yes		No
Satd. Flow (RTOR)						
Link Speed (mph)		30	30		25	
Link Distance (ft)		712	388		212	
Travel Time (s)		16.2	8.8		5.8	
Peak Hour Factor	0.93	0.93	0.88	0.88	0.89	0.89
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Adj. Flow (vph)	0	1382	1597	0	140	1455
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1382	1597	0	140	1455
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		24	24		16	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	0.85	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors		3	3		3	3
Detector Template		Thru	Thru		Left	
Leading Detector (ft)		256	256		256	256
Trailing Detector (ft)		-5	-5		-5	-5
Detector 1 Position(ft)		-5	-5		-5	-5
Detector 1 Size(ft)		50	50		50	50
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		125	125		125	125
Detector 2 Size(ft)		6	6		6	6
Detector 2 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0		0.0	0.0
Detector 3 Position(ft)		250	250		250	250
Detector 3 Size(ft)		6	6		6	6
Detector 3 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 3 Channel						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 3 Extend (s)		0.0	0.0		0.0	0.0
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0		5.0	5.0
Minimum Split (s)		14.0	21.0		27.0	27.0
Total Split (s)		66.0	66.0		74.0	74.0
Total Split (%)		47.1%	47.1%		52.9%	52.9%
Maximum Green (s)		60.0	60.0		68.0	68.0
Yellow Time (s)		2.0	2.0		2.0	2.0
All-Red Time (s)		4.0	4.0		4.0	4.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		14.0	14.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		60.0	60.0		68.0	68.0
Actuated g/C Ratio		0.43	0.43		0.49	0.49
v/c Ratio		0.93	1.09		0.15	1.12
Control Delay		36.3	52.2		20.5	98.2
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		36.3	52.2		20.5	98.2
LOS		D	D		C	F
Approach Delay		36.3	52.2		91.4	
Approach LOS		D	D		F	
Queue Length 50th (ft)		440	~843		69	~863
Queue Length 95th (ft)		m629	m#104		110	#994
Internal Link Dist (ft)		632	308		132	
Turn Bay Length (ft)						
Base Capacity (vph)		1487	1459		937	1302
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.93	1.09		0.15	1.12

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.12

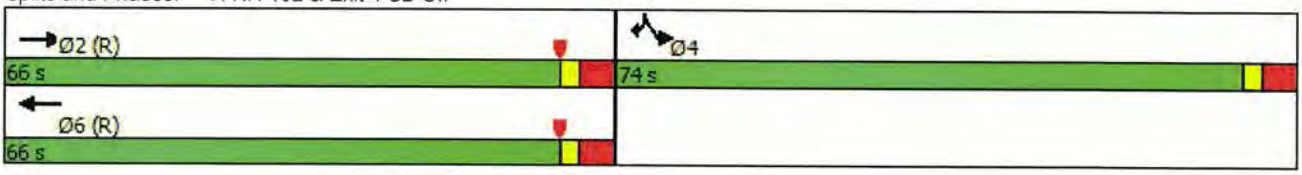
Intersection Signal Delay: 61.1 Intersection LOS: E
Intersection Capacity Utilization 96.1% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: NH 102 & Exit 4 SB Off



Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	1245	0	1005	0	0	1050	360	0	0	500	235
Future Volume (vph)	1245	0	1005	0	0	1050	360	0	0	500	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0	0	0	550		0	0		0
Storage Lanes		2	2	0	0	2		0	0		1
Taper Length (ft)		25		25		25			25		
Lane Util. Factor	0.97	1.00	0.88	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt			0.850								0.850
Flt Protected	0.950					0.950					
Satd. Flow (prot)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Flt Permitted	0.950					0.950					
Satd. Flow (perm)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Right Turn on Red			No					Yes			Yes
Satd. Flow (RTOR)											252
Link Speed (mph)		25		30			30			30	
Link Distance (ft)		856		390			760			857	
Travel Time (s)		23.3		8.9			17.3			19.5	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Adj. Flow (vph)	1415	0	1142	0	0	1117	383	0	0	543	255
Shared Lane Traffic (%)											
Lane Group Flow (vph)	1415	0	1142	0	0	1117	383	0	0	543	255
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		24		0			24			24	
Link Offset(ft)		12		0			0			0	
Crosswalk Width(ft)		16		16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	25	15	9	15		9	15		25
Number of Detectors	3		3			3	3			3	0
Detector Template											
Leading Detector (ft)	256		256			256	256			256	0
Trailing Detector (ft)	-5		-5			-5	-5			-5	0
Detector 1 Position(ft)	-5		-5			-5	-5			-5	-5
Detector 1 Size(ft)	55		55			55	55			55	50
Detector 1 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Queue (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Delay (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 2 Position(ft)	125		125			125	125			125	
Detector 2 Size(ft)	6		6			6	6			6	
Detector 2 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	
Detector 2 Channel											
Detector 2 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Detector 3 Position(ft)	250		250			250	250			250	
Detector 3 Size(ft)	6		6			6	6			6	

Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	
Detector 3 Channel											
Detector 3 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Detector Phase	8		2			5	2			6	
Switch Phase											
Minimum Initial (s)	10.0		10.0			5.0	8.0			8.0	
Minimum Split (s)	16.0		16.0			11.0	42.0			31.0	
Total Split (s)	61.0		61.0			48.0	79.0			31.0	
Total Split (%)	43.6%		43.6%			34.3%	56.4%			22.1%	
Maximum Green (s)	55.0		55.0			42.0	73.0			25.0	
Yellow Time (s)	2.0		2.0			2.0	2.0			2.0	
All-Red Time (s)	4.0		4.0			4.0	4.0			4.0	
Lost Time Adjust (s)	0.0		0.0			0.0	0.0			0.0	
Total Lost Time (s)	6.0		6.0			6.0	6.0			6.0	
Lead/Lag						Lead				Lag	
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Recall Mode	None		None			None	C-Min			C-Min	
Walk Time (s)							7.0			7.0	
Flash Dont Walk (s)							29.0			17.0	
Pedestrian Calls (#/hr)							0			0	
Act Effct Green (s)	55.0		55.0			42.0	73.0			25.0	140.0
Actuated g/C Ratio	0.39		0.39			0.30	0.52			0.18	1.00
v/c Ratio	1.11		1.10			1.12	0.21			0.87	0.16
Control Delay	101.4		101.0			83.6	3.9			71.2	0.2
Queue Delay	0.0		0.0			0.0	0.0			0.0	0.0
Total Delay	101.4		101.0			83.6	3.9			71.2	0.2
LOS	F		F			F	A			E	A
Approach Delay		101.2					63.3			48.5	
Approach LOS		F					E			D	
Queue Length 50th (ft)	~757		~671			~595	42			255	0
Queue Length 95th (ft)	#862		#790			m#674	m44			#347	0
Internal Link Dist (ft)		776		310			680			777	
Turn Bay Length (ft)						550					
Base Capacity (vph)	1273		1034			1000	1792			625	1568
Starvation Cap Reductn	0		0			0	0			0	0
Spillback Cap Reductn	0		0			0	0			0	0
Storage Cap Reductn	0		0			0	0			0	0
Reduced v/c Ratio	1.11		1.10			1.12	0.21			0.87	0.16

Intersection Summary	
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 53 (38%), Referenced to phase 2:NET and 6:SWT, Start of Yellow	
Natural Cycle: 150	

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.12
Intersection Signal Delay: 80.8 Intersection LOS: F
Intersection Capacity Utilization 95.3% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: NH 102 & Exit 4 NB Off

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	650	460	165	580	0	0	0	0	185	0	390
Future Volume (vph)	0	650	460	165	580	0	0	0	0	185	0	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		350	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3471	1553	1719	3438	0	0	0	0	3367	0	1553
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	3471	1553	1719	3438	0	0	0	0	3367	0	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			529									231
Link Speed (mph)		30			30			30			35	
Link Distance (ft)		851			693			486			581	
Travel Time (s)		19.3			15.8			11.0			11.3	
Peak Hour Factor	0.87	0.87	0.87	0.86	0.86	0.86	0.92	0.92	0.92	0.91	0.91	0.91
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	0	747	529	192	674	0	0	0	0	203	0	429
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	747	529	192	674	0	0	0	0	203	0	429
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Right	Left	Right
Median Width(ft)		36			36			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		25	15		9	15		9	15		25
Number of Detectors		3	3	3	3					3		3
Detector Template		Thru	Right	Left	Thru					Left		Right
Leading Detector (ft)		256	256	256	256					256		256
Trailing Detector (ft)		-5	-5	-5	-5					-5		-5
Detector 1 Position(ft)		-5	-5	-5	-5					-5		-5
Detector 1 Size(ft)		50	50	50	50					50		50
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 2 Position(ft)		125	125	125	125					125		125
Detector 2 Size(ft)		6	6	6	6					6		6
Detector 2 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 3 Position(ft)		250	250	250	250					250		250
Detector 3 Size(ft)		6	6	6	6					6		6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 3 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 3 Channel												
Detector 3 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Detector Phase		2		1	6					4		4
Switch Phase												
Minimum Initial (s)		9.0		4.0	9.0					4.0		4.0
Minimum Split (s)		21.0		10.0	21.0					10.0		10.0
Total Split (s)		34.0		23.0	57.0					33.0		33.0
Total Split (%)		37.8%		25.6%	63.3%					36.7%		36.7%
Maximum Green (s)		28.0		17.0	51.0					27.0		27.0
Yellow Time (s)		4.0		4.0	4.0					4.0		4.0
All-Red Time (s)		2.0		2.0	2.0					2.0		2.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0					6.0		6.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Recall Mode		C-Min		None	C-Min					None		None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		8.0			8.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)		37.3	90.0	14.4	57.6					20.4		20.4
Actuated g/C Ratio		0.41	1.00	0.16	0.64					0.23		0.23
v/c Ratio		0.52	0.34	0.70	0.31					0.27		0.81
Control Delay		23.7	0.6	23.2	0.4					27.8		26.5
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		23.7	0.6	23.2	0.4					27.8		26.5
LOS		C	A	C	A					C		C
Approach Delay		14.1			5.5						27.0	
Approach LOS		B			A						C	
Queue Length 50th (ft)		172	0	6	0					47		105
Queue Length 95th (ft)		247	0	0	m0					71		205
Internal Link Dist (ft)		771			613			406			501	
Turn Bay Length (ft)			350									
Base Capacity (vph)		1436	1553	324	2202					1010		627
Starvation Cap Reductn		0	0	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.52	0.34	0.59	0.31					0.20		0.68

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 52 (58%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 60

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 14.3 Intersection LOS: B
Intersection Capacity Utilization 72.6% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Exit 5 SB On/Exit 5 SB Off & NH 28

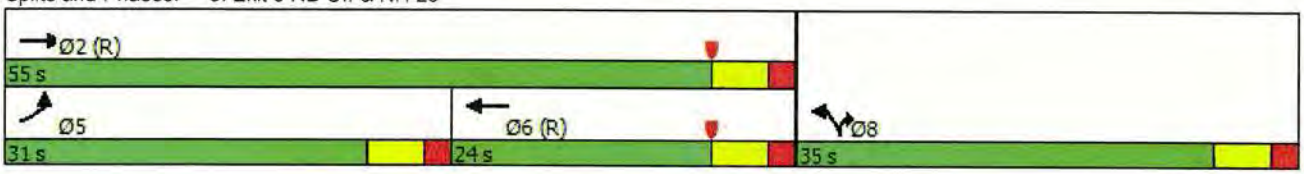
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	445	390	0	0	385	235	360	0	380	0	0	0
Future Volume (vph)	445	390	0	0	385	235	360	0	380	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1752	3505	0	0	3505	1568	1703	0	1524	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1752	3505	0	0	3505	1568	1703	0	1524	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						258			399			
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		693			542			867			392	
Travel Time (s)		15.8			12.3			16.9			8.9	
Peak Hour Factor	0.92	0.92	0.92	0.91	0.91	0.91	0.67	0.67	0.67	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	6%	6%	6%	2%	2%	2%
Adj. Flow (vph)	484	424	0	0	423	258	537	0	567	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	484	424	0	0	423	258	537	0	567	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Right	Left	Right	Left	Left	Right
Median Width(ft)		36			42			12			12	
Link Offset(ft)		0			0			0			36	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		25	15		25	15		9
Number of Detectors	3	3			3	3	3		0			
Detector Template	Left					Right	Left					
Leading Detector (ft)	256	256			256	256	256		0			
Trailing Detector (ft)	-5	-5			-5	-5	-5		0			
Detector 1 Position(ft)	-5	-5			-5	-5	-5		-5			
Detector 1 Size(ft)	50	50			50	50	50		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 2 Position(ft)	125	125			125	125	125					
Detector 2 Size(ft)	6	6			6	6	6					
Detector 2 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex					
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0			0.0	0.0	0.0					
Detector 3 Position(ft)	250	250			250	250	250					
Detector 3 Size(ft)	6	6			6	6	6					
Detector 3 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex					
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0			0.0	0.0	0.0					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Detector Phase	5	2			6		8		8			
Switch Phase												
Minimum Initial (s)	4.0	16.0			16.0		4.0		4.0			
Minimum Split (s)	10.0	23.0			23.0		11.0		11.0			
Total Split (s)	31.0	55.0			24.0		35.0		35.0			
Total Split (%)	34.4%	61.1%			26.7%		38.9%		38.9%			
Maximum Green (s)	25.0	49.0			18.0		29.0		29.0			
Yellow Time (s)	4.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	2.0	2.0			2.0		2.0		2.0			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.0		6.0		6.0			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		10.0			10.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	25.0	48.6			17.6	90.0	29.4		29.4			
Actuated g/C Ratio	0.28	0.54			0.20	1.00	0.33		0.33			
v/c Ratio	1.00	0.22			0.62	0.16	0.97		0.74			
Control Delay	52.3	3.9			37.5	0.2	62.7		14.7			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	52.3	3.9			37.5	0.2	62.7		14.7			
LOS	D	A			D	A	E		B			
Approach Delay		29.7			23.3			38.0				
Approach LOS		C			C			D				
Queue Length 50th (ft)	273	16			115	0	300		76			
Queue Length 95th (ft)	#454	10			165	0	287		62			
Internal Link Dist (ft)		613			462			787			312	
Turn Bay Length (ft)												
Base Capacity (vph)	486	1908			701	1568	556		766			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.00	0.22			0.60	0.16	0.97		0.74			

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 31.5		Intersection LOS: C	

Intersection Capacity Utilization 72.6% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Exit 5 NB Off & NH 28



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	5	210	10	0	10	410	910	120	5	650	120
Future Volume (vph)	10	5	210	10	0	10	410	910	120	5	650	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		225	0		0	350		0	100		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.932			0.983			0.977	
Flt Protected		0.967			0.976		0.950			0.950		
Satd. Flow (prot)	0	1801	1583	0	1728	0	1770	3479	0	1770	3458	0
Flt Permitted		0.878			0.834		0.950			0.950		
Satd. Flow (perm)	0	1635	1583	0	1477	0	1770	3479	0	1770	3458	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			228		182			25			24	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		593			447			750			330	
Travel Time (s)		13.5			10.2			17.0			7.5	
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	11	5	228	40	0	40	446	989	130	5	707	130
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	228	0	80	0	446	1119	0	5	837	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	3	1	3	1		3	3		3	3	
Detector Template	Left	Thru	Right	Left			Left	Thru		Left	Thru	
Leading Detector (ft)	256	256	45	256	45		256	256		256	256	
Trailing Detector (ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Position(ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	125	125		125			125	125		125	125	
Detector 2 Size(ft)	6	6		6			6	6		6	6	
Detector 2 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Detector 3 Position(ft)	250	250		250			250	250		250	250	
Detector 3 Size(ft)	6	6		6			6	6		6	6	

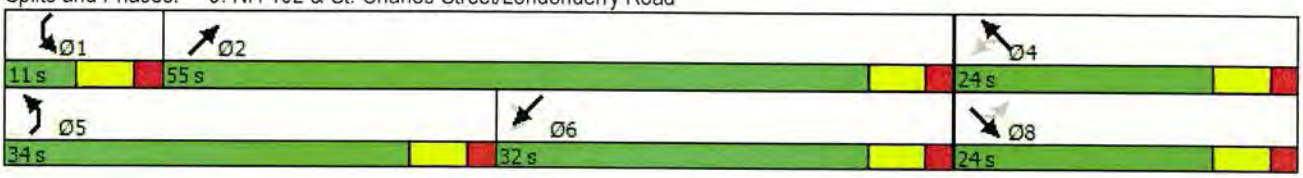
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	custom	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Detector Phase	8	8	6	4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	8.0	5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		24.0	24.0		11.0	24.0	
Total Split (s)	24.0	24.0	32.0	24.0	24.0		34.0	55.0		11.0	32.0	
Total Split (%)	26.7%	26.7%	35.6%	26.7%	26.7%		37.8%	61.1%		12.2%	35.6%	
Maximum Green (s)	18.0	18.0	26.0	18.0	18.0		28.0	49.0		5.0	26.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lead/Lag			Lag				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	Min	None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0			0	
Act Effct Green (s)		6.7	25.2		6.7		23.6	55.0		5.2	25.2	
Actuated g/C Ratio		0.09	0.36		0.09		0.33	0.78		0.07	0.36	
v/c Ratio		0.10	0.32		0.26		0.75	0.41		0.04	0.67	
Control Delay		34.6	4.5		2.1		31.3	4.9		35.6	23.7	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		34.6	4.5		2.1		31.3	4.9		35.6	23.7	
LOS		C	A		A		C	A		D	C	
Approach Delay		6.5			2.1			12.4			23.8	
Approach LOS		A			A			B			C	
Queue Length 50th (ft)		7	0		0		184	71		2	174	
Queue Length 95th (ft)		26	46		0		298	193		13	254	
Internal Link Dist (ft)		513			367			670			250	
Turn Bay Length (ft)			225				350			100		
Base Capacity (vph)		435	748		526		732	2712		131	1344	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.04	0.30		0.15		0.61	0.41		0.04	0.62	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 70.7
Natural Cycle: 80
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.75
Intersection Signal Delay: 15.1 Intersection LOS: B
Intersection Capacity Utilization 71.1% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 9: NH 102 & St. Charles Street/Londonderry Road



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	30	5	260	0	40	0	790	130	15	420	0
Future Volume (vph)	20	30	5	260	0	40	0	790	130	15	420	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.982			0.981				
Flt Protected		0.982			0.959						0.998	
Satd. Flow (prot)	0	1807	0	0	1737	0	0	1726	0	0	1806	0
Flt Permitted		0.875			0.739						0.804	
Satd. Flow (perm)	0	1610	0	0	1339	0	0	1726	0	0	1455	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			36			18				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		356			493			1124			603	
Travel Time (s)		8.1			11.2			25.5			13.7	
Peak Hour Factor	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Adj. Flow (vph)	33	50	8	271	0	42	0	888	146	17	488	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	91	0	0	313	0	0	1034	0	0	505	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		-22			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	1		3	2			2		3	2	
Detector Template	Left			Left						Left		
Leading Detector (ft)	256	45		256	131			131		256	131	
Trailing Detector (ft)	-5	-5		-5	-5			-5		-5	-5	
Detector 1 Position(ft)	-5	-5		-5	-5			-5		-5	-5	
Detector 1 Size(ft)	50	50		50	50			50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Detector 2 Position(ft)	125			125	125			125		125	125	
Detector 2 Size(ft)	6			6	6			6		6	6	
Detector 2 Type	Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0	0.0			0.0		0.0	0.0	
Detector 3 Position(ft)	250			250						250		
Detector 3 Size(ft)	6			6						6		
Detector 3 Type	Cl+Ex			Cl+Ex						Cl+Ex		
Detector 3 Channel												
Detector 3 Extend (s)	0.0			0.0						0.0		

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4						2		
Detector Phase	4	4		4	4			2		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0			24.0		24.0	24.0	
Total Split (s)	26.0	26.0		26.0	26.0			64.0		64.0	64.0	
Total Split (%)	28.9%	28.9%		28.9%	28.9%			71.1%		71.1%	71.1%	
Maximum Green (s)	20.0	20.0		20.0	20.0			58.0		58.0	58.0	
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Recall Mode	None	None		None	None			Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)		20.0			20.0			55.7			55.7	
Actuated g/C Ratio		0.23			0.23			0.63			0.63	
v/c Ratio		0.25			0.94			0.94			0.55	
Control Delay		29.3			68.7			31.6			11.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		29.3			68.7			31.6			11.6	
LOS		C			E			C			B	
Approach Delay		29.3			68.7			31.6			11.6	
Approach LOS		C			E			C			B	
Queue Length 50th (ft)		40			159			456			140	
Queue Length 95th (ft)		52			#326			#786			204	
Internal Link Dist (ft)		276			413			1044			523	
Turn Bay Length (ft)												
Base Capacity (vph)		371			333			1148			963	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.25			0.94			0.90			0.52	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 87.8			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 32.3		Intersection LOS: C	
Intersection Capacity Utilization 86.3%		ICU Level of Service E	

Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: NH 102 & Fordway/Madden Hill Road

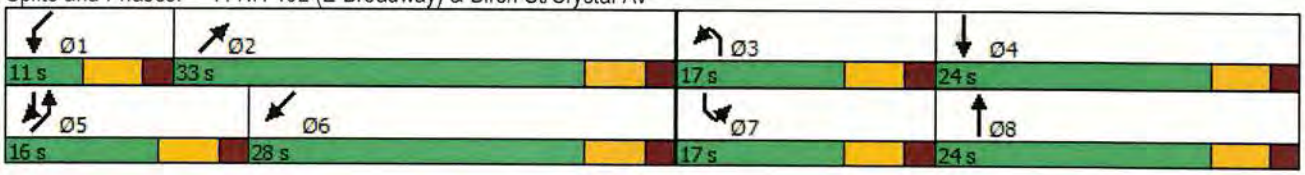
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	70	320	30	110	370	40	100	450	40	50	340	80
Future Volume (vph)	70	320	30	110	370	40	100	450	40	50	340	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	70		0	245		245	390		0	110		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987				0.850		0.988			0.971	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1821	0	1752	1845	1568	1787	1859	0	1787	1827	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1821	0	1752	1845	1568	1787	1859	0	1787	1827	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				116		5			13	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		361			411			477			530	
Travel Time (s)		8.2			9.3			10.8			12.0	
Peak Hour Factor	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95	0.94	0.94	0.94
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	77	352	33	118	398	43	105	474	42	53	362	85
Shared Lane Traffic (%)												
Lane Group Flow (vph)	77	385	0	118	398	43	105	516	0	53	447	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4	5	5	2		1	6	
Permitted Phases						4						
Detector Phase	3	8		7	4	5	5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	10.0	4.0	4.0	10.0		4.0	9.0	
Minimum Split (s)	17.0	24.0		11.0	24.0	16.0	16.0	24.0		11.0	24.0	
Total Split (s)	17.0	24.0		17.0	24.0	16.0	16.0	33.0		11.0	28.0	
Total Split (%)	20.0%	28.2%		20.0%	28.2%	18.8%	18.8%	38.8%		12.9%	32.9%	
Maximum Green (s)	11.0	18.0		11.0	18.0	10.0	10.0	27.0		5.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Max		None	None	
Act Effct Green (s)	8.7	18.4		9.6	19.2	34.2	8.9	29.5		5.1	23.9	
Actuated g/C Ratio	0.11	0.23		0.12	0.24	0.43	0.11	0.37		0.06	0.30	
v/c Ratio	0.40	0.90		0.55	0.89	0.06	0.52	0.74		0.46	0.79	
Control Delay	41.1	57.6		45.2	55.6	0.1	45.2	32.3		52.3	40.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	41.1	57.6		45.2	55.6	0.1	45.2	32.3		52.3	40.7	
LOS	D	E		D	E	A	D	C		D	D	
Approach Delay		54.8			49.2			34.4			41.9	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		D			D			C			D	
Queue Length 50th (ft)	39	204		60	209	0	53	255		28	227	
Queue Length 95th (ft)	80	#386		113	#400	0	104	#435		#74	#408	
Internal Link Dist (ft)		281			331			397			450	
Turn Bay Length (ft)	70			245		245	390			110		
Base Capacity (vph)	250	430		250	449	772	232	699		116	564	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.31	0.90		0.47	0.89	0.06	0.45	0.74		0.46	0.79	

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 78.7
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 44.4 — Intersection LOS: D
Intersection Capacity Utilization 89.4% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: NH 102 (E Broadway) & Birch St/Crystal Av



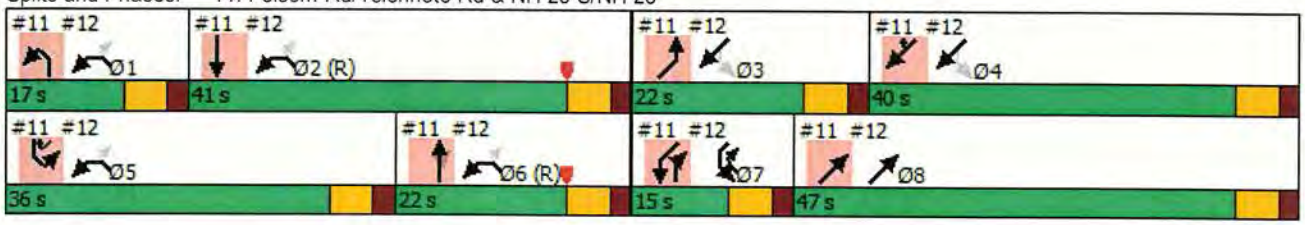
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	70	340	190	650	530	0	300	480	110	30	250	930
Future Volume (vph)	70	340	190	650	530	0	300	480	110	30	250	930
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	80		180	525		190	190		180	160		0
Storage Lanes	1		1	2		0	2		1	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	1.00	1.00	0.88
Frt			0.850						0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	3433	3539	0	3433	1863	1583	1787	1881	2814
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	3433	3539	0	3433	1863	1583	1787	1881	2814
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			191						300			136
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		639			801			532			387	
Travel Time (s)		14.5			18.2			12.1			8.8	
Peak Hour Factor	0.92	0.92	0.92	0.94	0.94	0.94	0.96	0.96	0.96	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	76	370	207	691	564	0	313	500	115	32	263	979
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	370	207	691	564	0	313	500	115	32	263	979
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	1	6	7	5	2		3	8		7	4	4 5
Permitted Phases		6	6		2			8	Free		4	
Detector Phase	1	6	7	5	2		3	8		7	4	4 5
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		8.0	5.0		8.0	5.0	
Minimum Split (s)	14.0	22.0	14.0	14.0	22.0		14.0	39.0		14.0	39.0	
Total Split (s)	17.0	22.0	15.0	36.0	41.0		22.0	47.0		15.0	40.0	
Total Split (%)	14.2%	18.3%	12.5%	30.0%	34.2%		18.3%	39.2%		12.5%	33.3%	
Maximum Green (s)	11.0	16.0	9.0	30.0	35.0		16.0	41.0		9.0	34.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	None	None	C-Max		None	None		None	None	
Walk Time (s)		5.0			5.0			7.0			7.0	
Flash Dont Walk (s)		11.0			11.0			26.0			26.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	11.0	16.7	31.4	29.3	35.0		16.0	41.3	120.0	8.7	34.0	69.3
Actuated g/C Ratio	0.09	0.14	0.26	0.24	0.29		0.13	0.34	1.00	0.07	0.28	0.58
v/c Ratio	0.47	0.75	0.37	0.83	0.55		0.68	0.78	0.07	0.25	0.49	0.58
Control Delay	61.9	60.4	8.4	56.9	29.1		58.1	45.2	0.1	81.4	27.1	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	2.0	0.0	0.0	1.1	1.4

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	61.9	60.4	8.4	56.9	29.1		58.1	47.2	0.1	81.4	28.2	11.1
LOS	E	E	A	E	C		E	D	A	F	C	B
Approach Delay		44.1			44.4			45.0			16.4	
Approach LOS		D			D			D			B	
Queue Length 50th (ft)	57	147	9	236	143		120	346	0	26	152	283
Queue Length 95th (ft)	109	#214	70	339	190		170	484	0	m44	219	374
Internal Link Dist (ft)		559			721			452			307	
Turn Bay Length (ft)	80		180	525			190		180	160		
Base Capacity (vph)	162	492	558	858	1032		457	641	1583	134	532	1698
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	109	491
Spillback Cap Reductn	0	0	5	0	0		0	53	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.75	0.37	0.81	0.55		0.68	0.85	0.07	0.24	0.62	0.81

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 17 (14%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 35.8 Intersection LOS: D
Intersection Capacity Utilization 79.9% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Folsom Rd/Tsienneto Rd & NH 28 S/NH 28



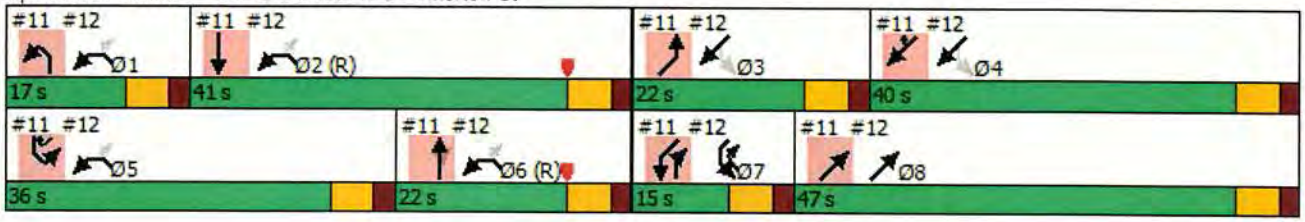
Lane Group	NWL	NWR	NET	NER	SWL	SWT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6
Lane Configurations												
Traffic Volume (vph)	310	110	800	530	90	920						
Future Volume (vph)	310	110	800	530	90	920						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900						
Storage Length (ft)	90	0		0	175							
Storage Lanes	1	1		1	1							
Taper Length (ft)	25				25							
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95						
Frt		0.850		0.850								
Flt Protected	0.950				0.950							
Satd. Flow (prot)	1787	1599	3574	1599	1787	3574						
Flt Permitted	0.950				0.157							
Satd. Flow (perm)	1787	1599	3574	1599	295	3574						
Right Turn on Red		Yes		Yes								
Satd. Flow (RTOR)		41		416								
Link Speed (mph)	30		30			30						
Link Distance (ft)	403		387			233						
Travel Time (s)	9.2		8.8			5.3						
Peak Hour Factor	0.86	0.86	0.96	0.96	0.85	0.85						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%						
Adj. Flow (vph)	360	128	833	552	106	1082						
Shared Lane Traffic (%)												
Lane Group Flow (vph)	360	128	833	552	106	1082						
Turn Type	Prot	pm+ov	NA	Free	pm+pt	NA						
Protected Phases	1 2 5 6	7	8		7	3 4	1	2	3	4	5	6
Permitted Phases		1 2 5 6		Free	3 4							
Detector Phase	1 2 5 6	7	8		7	3 4						
Switch Phase												
Minimum Initial (s)		8.0	5.0		8.0		8.0	8.0	8.0	5.0	8.0	8.0
Minimum Split (s)		14.0	39.0		14.0		14.0	22.0	14.0	39.0	14.0	22.0
Total Split (s)		15.0	47.0		15.0		17.0	41.0	22.0	40.0	36.0	22.0
Total Split (%)		12.5%	39.2%		12.5%		14%	34%	18%	33%	30%	18%
Maximum Green (s)		9.0	41.0		9.0		11.0	35.0	16.0	34.0	30.0	16.0
Yellow Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		2.0	2.0		2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0							
Total Lost Time (s)		6.0	6.0		6.0							
Lead/Lag		Lead	Lag		Lead		Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?		Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode		None	None		None		None	C-Max	None	None	None	C-Max
Walk Time (s)			7.0					5.0		7.0		5.0
Flash Dont Walk (s)			26.0					11.0		26.0		11.0
Pedestrian Calls (#/hr)			0					0		0		0
Act Effct Green (s)	52.0	66.7	41.3	120.0	56.0	56.0						
Actuated g/C Ratio	0.43	0.56	0.34	1.00	0.47	0.47						
v/c Ratio	0.47	0.14	0.68	0.35	0.43	0.65						
Control Delay	26.6	9.0	41.3	0.4	23.9	26.8						
Queue Delay	0.0	0.0	5.8	0.0	0.0	0.1						

Lane Group	NWL	NWR	NET	NER	SWL	SWT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6
Total Delay	26.6	9.0	47.0	0.4	23.9	26.9						
LOS	C	A	D	A	C	C						
Approach Delay	22.0		28.4			26.6						
Approach LOS	C		C			C						
Queue Length 50th (ft)	194	30	251	0	45	328						
Queue Length 95th (ft)	265	57	348	m0	75	368						
Internal Link Dist (ft)	323		307			153						
Turn Bay Length (ft)	90				175							
Base Capacity (vph)	774	910	1231	1599	249	1667						
Starvation Cap Reductn	0	0	336	0	0	0						
Spillback Cap Reductn	0	0	0	0	0	74						
Storage Cap Reductn	0	0	0	0	0	0						
Reduced v/c Ratio	0.47	0.14	0.93	0.35	0.43	0.68						

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 17 (14%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 26.7 Intersection LOS: C
Intersection Capacity Utilization 61.0% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 12: Tsienneto Rd & Pinkerton St



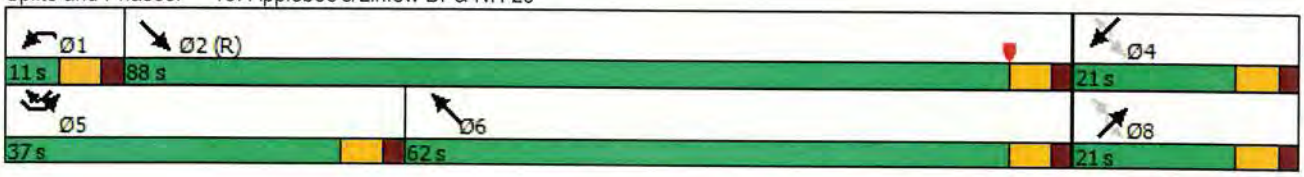
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	380	1475	5	20	1290	120	15	10	15	10	10	160
Future Volume (vph)	380	1475	5	20	1290	120	15	10	15	10	10	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	115		0	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.987				0.850			0.850
Flt Protected	0.950			0.950				0.971			0.976	
Satd. Flow (prot)	1787	3574	0	1787	3528	0	0	1845	1615	0	1836	1599
Flt Permitted	0.950			0.950				0.799			0.827	
Satd. Flow (perm)	1787	3574	0	1787	3528	0	0	1518	1615	0	1556	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			11				136			27
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		439			341			230			387	
Travel Time (s)		10.0			7.8			5.2			8.8	
Peak Hour Factor	0.97	0.97	0.97	0.95	0.95	0.95	0.90	0.90	0.90	0.80	0.80	0.80
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	392	1521	5	21	1358	126	17	11	17	13	13	200
Shared Lane Traffic (%)												
Lane Group Flow (vph)	392	1526	0	21	1484	0	0	28	17	0	26	200
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases							8		8	4	4	4
Detector Phase	5	2		1	6		8	8	8	4	4	5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	26.0	63.0		11.0	48.0		21.0	21.0	21.0	21.0	21.0	26.0
Total Split (s)	37.0	88.0		11.0	62.0		21.0	21.0	21.0	21.0	21.0	37.0
Total Split (%)	30.8%	73.3%		9.2%	51.7%		17.5%	17.5%	17.5%	17.5%	17.5%	30.8%
Maximum Green (s)	31.0	82.0		5.0	56.0		15.0	15.0	15.0	15.0	15.0	31.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	Max		None	None	None	None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		8.0	8.0	8.0	8.0	8.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	
Act Effct Green (s)	31.2	101.8		7.0	68.0			7.7	7.7		7.6	40.0
Actuated g/C Ratio	0.26	0.85		0.06	0.57			0.06	0.06		0.06	0.33
v/c Ratio	0.85	0.50		0.20	0.74			0.29	0.07		0.27	0.36
Control Delay	50.6	7.1		67.7	23.0			60.5	0.6		59.3	25.7
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	50.6	7.1		67.7	23.0			60.5	0.6		59.3	25.7
LOS	D	A		E	C			E	A		E	C
Approach Delay		16.0			23.6			37.9			29.6	
Approach LOS		B			C			D			C	
Queue Length 50th (ft)	325	159		17	614			21	0		20	92
Queue Length 95th (ft)	m375	355		m26	720			51	0		43	120
Internal Link Dist (ft)		359			261			150			307	
Turn Bay Length (ft)	300			115								
Base Capacity (vph)	492	3032		103	2002			189	320		194	577
Starvation Cap Reductn	0	0		0	0			0	0		0	0
Spillback Cap Reductn	0	0		0	0			0	0		0	0
Storage Cap Reductn	0	0		0	0			0	0		0	0
Reduced v/c Ratio	0.80	0.50		0.20	0.74			0.15	0.05		0.13	0.35

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:SET, Start of Yellow
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 20.2 Intersection LOS: C
Intersection Capacity Utilization 83.6% ICU Level of Service E
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Applebee's/Linlew Dr & NH 28



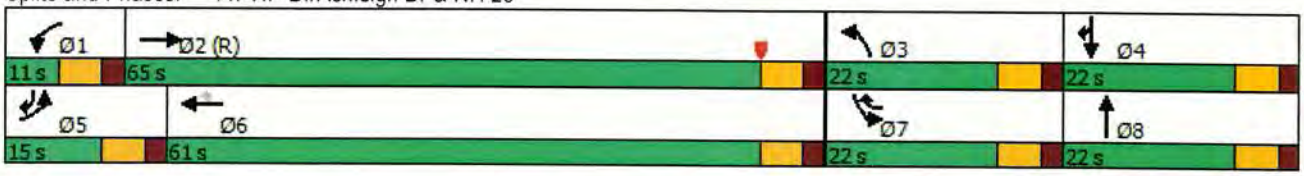
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	1550	10	5	1240	410	40	10	10	200	5	280
Future Volume (vph)	150	1550	10	5	1240	410	40	10	10	200	5	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		150	205		150	0		0	325		150
Storage Lanes	2		0	1		1	1		0	1		1
Taper Length (ft)	150			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.999				0.850		0.925				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.955	
Satd. Flow (prot)	3467	3571	0	1770	3539	1583	1805	1758	0	1715	1724	1615
Flt Permitted	0.950			0.950			0.950			0.950	0.450	
Satd. Flow (perm)	3467	3571	0	1770	3539	1583	1805	1758	0	1715	812	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				369		13				165
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		877			314			151			476	
Travel Time (s)		19.9			7.1			3.4			10.8	
Peak Hour Factor	0.84	0.84	0.84	0.90	0.90	0.90	0.78	0.78	0.78	0.86	0.86	0.86
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	179	1845	12	6	1378	456	51	13	13	233	6	326
Shared Lane Traffic (%)										49%		
Lane Group Flow (vph)	179	1857	0	6	1378	456	51	26	0	119	120	326
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	pt+ov
Protected Phases	5	2		1	6	7	3	8		7	4	4 5
Permitted Phases		2			6	6		8				
Detector Phase	5	2		1	6	7	3	8		7	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0	8.0	5.0	5.0		8.0	8.0	
Minimum Split (s)	11.0	53.0		11.0	50.0	22.0	22.0	22.0		22.0	22.0	
Total Split (s)	15.0	65.0		11.0	61.0	22.0	22.0	22.0		22.0	22.0	
Total Split (%)	12.5%	54.2%		9.2%	50.8%	18.3%	18.3%	18.3%		18.3%	18.3%	
Maximum Green (s)	9.0	59.0		5.0	55.0	16.0	16.0	16.0		16.0	16.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	None	None	None	None		None	None	
Walk Time (s)											5.0	
Flash Dont Walk (s)											11.0	
Pedestrian Calls (#/hr)											0	
Act Effct Green (s)	9.1	70.1		5.1	57.2	85.1	8.8	12.3		21.9	21.9	38.3
Actuated g/C Ratio	0.08	0.58		0.04	0.48	0.71	0.07	0.10		0.18	0.18	0.32
v/c Ratio	0.68	0.89		0.08	0.82	0.37	0.39	0.14		0.38	0.38	0.52
Control Delay	67.6	29.2		57.4	24.3	0.8	60.8	30.8		50.6	50.6	20.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	67.6	29.2		57.4	24.3	0.8	60.8	30.8		50.6	50.6	20.1
LOS	E	C		E	C	A	E	C		D	D	C
Approach Delay		32.5			18.6			50.7			33.0	
Approach LOS		C			B			D			C	
Queue Length 50th (ft)	71	622		5	234	2	38	9		93	94	98
Queue Length 95th (ft)	102	#856		m10	365	4	67	30		150	151	181
Internal Link Dist (ft)		797			234			71			396	
Turn Bay Length (ft)	200			205		150				325		150
Base Capacity (vph)	267	2087		75	1687	1235	240	253		320	314	622
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.67	0.89		0.08	0.82	0.37	0.21	0.10		0.37	0.38	0.52

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 27.2 Intersection LOS: C
Intersection Capacity Utilization 74.7% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: VIP Dr/Ashleigh Dr & NH 28



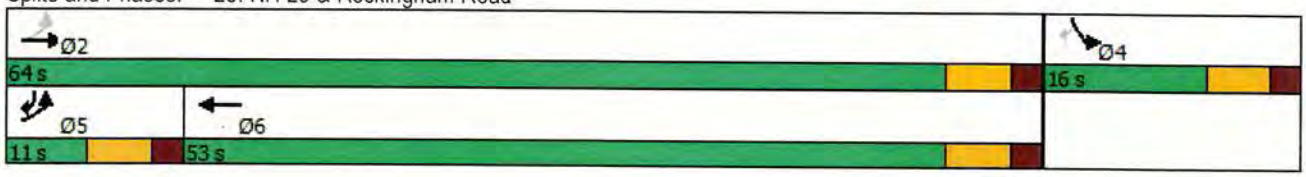
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	140	1360	1415	270	120	70
Future Volume (vph)	140	1360	1415	270	120	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			150	360	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.976			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3454	0	1770	1583
Flt Permitted	0.079				0.950	
Satd. Flow (perm)	147	3539	3454	0	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			48			32
Link Speed (mph)		30	30		30	
Link Distance (ft)		463	580		704	
Travel Time (s)		10.5	13.2		16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	1478	1538	293	130	76
Shared Lane Traffic (%)						
Lane Group Flow (vph)	152	1478	1831	0	130	76
Turn Type	pm+pt	NA	NA		Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2					4
Detector Phase	5	2	6		4	5
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	11.0	20.0	20.0		11.0	11.0
Total Split (s)	11.0	64.0	53.0		16.0	11.0
Total Split (%)	13.8%	80.0%	66.3%		20.0%	13.8%
Maximum Green (s)	5.0	58.0	47.0		10.0	5.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	None		None	None
Act Effct Green (s)	55.7	57.5	44.2		9.3	16.9
Actuated g/C Ratio	0.76	0.78	0.60		0.13	0.23
v/c Ratio	0.67	0.53	0.87		0.59	0.20
Control Delay	27.5	5.4	19.2		44.9	16.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	27.5	5.4	19.2		44.9	16.4
LOS	C	A	B		D	B
Approach Delay		7.5	19.2		34.4	
Approach LOS		A	B		C	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 50th (ft)	21	148	372		62	17
Queue Length 95th (ft)	#111	194	#516		#126	49
Internal Link Dist (ft)		383	500		624	
Turn Bay Length (ft)	200				360	
Base Capacity (vph)	226	2764	2308		249	387
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.67	0.53	0.79		0.52	0.20

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 73.6
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 14.8 — Intersection LOS: B
Intersection Capacity Utilization 77.1% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 25: NH 28 & Rockingham Road



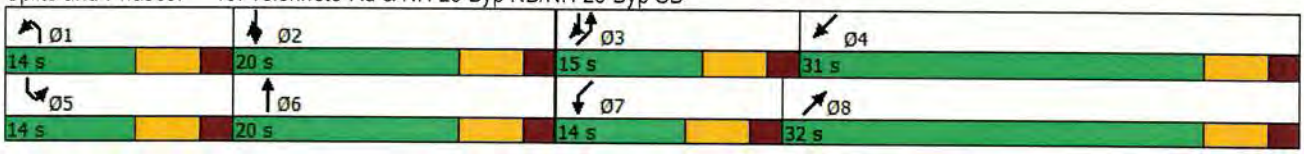
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	70	30	50	40	210	90	840	70	20	360	40
Future Volume (vph)	30	70	30	50	40	210	90	840	70	20	360	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	145		110	280		280	360		0	120		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.955				0.850		0.988			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1779	0	1787	1881	1599	1805	3567	0	1805	3556	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1779	0	1787	1881	1599	1805	3567	0	1805	3556	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23				221		11			15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		481			490			479			371	
Travel Time (s)		10.9			11.1			10.9			8.4	
Peak Hour Factor	0.99	0.99	0.99	0.95	0.95	0.95	0.89	0.89	0.89	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	30	71	30	53	42	221	101	944	79	22	387	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	101	0	53	42	221	101	1023	0	22	430	0
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases		6			2							
Detector Phase	1	6		5	2	2 3	3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	20.0		14.0	20.0		14.0	28.0		14.0	14.0	
Total Split (s)	14.0	20.0		14.0	20.0		15.0	32.0		14.0	31.0	
Total Split (%)	17.5%	25.0%		17.5%	25.0%		18.8%	40.0%		17.5%	38.8%	
Maximum Green (s)	8.0	14.0		8.0	14.0		9.0	26.0		8.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	Max		None	None		None	None	
Walk Time (s)								7.0				
Flash Dont Walk (s)								15.0				
Pedestrian Calls (#/hr)								0				
Act Effct Green (s)	8.4	13.5		8.4	16.4	31.5	8.9	26.1		8.4	15.4	
Actuated g/C Ratio	0.13	0.21		0.13	0.26	0.49	0.14	0.41		0.13	0.24	
v/c Ratio	0.13	0.26		0.23	0.09	0.25	0.40	0.70		0.09	0.50	
Control Delay	32.3	23.5		33.2	24.9	3.7	35.3	22.0		32.2	22.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	32.3	23.5		33.2	24.9	3.7	35.3	22.0		32.2	22.3	
LOS	C	C		C	C	A	D	C		C	C	
Approach Delay		25.5			11.4			23.2			22.8	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	10	27		18	10	0	35	145		7	73	
Queue Length 95th (ft)	39	77		59	45	43	95	#355		32	123	
Internal Link Dist (ft)		401			410			399			291	
Turn Bay Length (ft)	145			280		280	360			120		
Base Capacity (vph)	232	425		234	481	912	266	1539		236	1465	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.13	0.24		0.23	0.09	0.24	0.38	0.66		0.09	0.29	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 64
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 21.4 — Intersection LOS: C
Intersection Capacity Utilization 56.6% — ICU Level of Service B
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: Tsienneto Rd & NH 28 Byp NB/NH 28 Byp SB



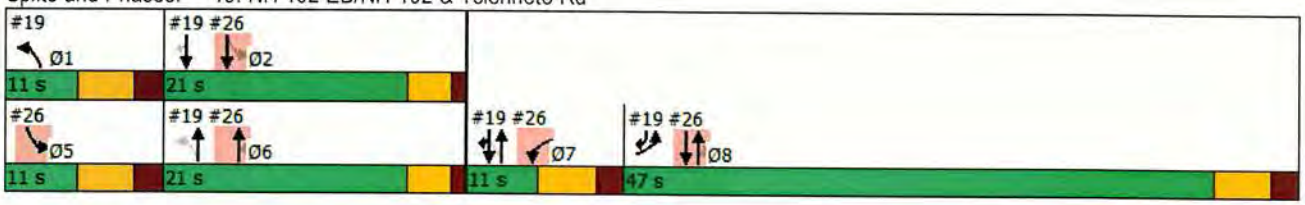
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø2	Ø5	Ø6	Ø7
Lane Configurations										
Traffic Volume (vph)	710	5	10	260	200	340				
Future Volume (vph)	710	5	10	260	200	340				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	200	0	100			90				
Storage Lanes	0	0	1			1				
Taper Length (ft)	25		25							
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Frt	0.999					0.850				
Flt Protected	0.953		0.950							
Satd. Flow (prot)	1791	0	1770	1863	1845	1568				
Flt Permitted	0.953		0.516							
Satd. Flow (perm)	1791	0	961	1863	1845	1568				
Right Turn on Red		Yes				Yes				
Satd. Flow (RTOR)	1					382				
Link Speed (mph)	30			30	30					
Link Distance (ft)	392			704	263					
Travel Time (s)	8.9			16.0	6.0					
Peak Hour Factor	0.90	0.90	0.87	0.87	0.89	0.89				
Heavy Vehicles (%)	1%	1%	2%	2%	3%	3%				
Adj. Flow (vph)	789	6	11	299	225	382				
Shared Lane Traffic (%)										
Lane Group Flow (vph)	795	0	11	299	225	382				
Turn Type	Prot		pm+pt	NA	NA	custom				
Protected Phases	8		1	6 7	2 7	7 8	2	5	6	7
Permitted Phases			6 7			2				
Detector Phase	8		1	6 7	2 7	7 8				
Switch Phase										
Minimum Initial (s)	5.0		5.0				5.0	5.0	5.0	5.0
Minimum Split (s)	26.5		11.0				9.0	11.0	9.0	11.0
Total Split (s)	47.0		11.0				21.0	11.0	21.0	11.0
Total Split (%)	52.2%		12.2%				23%	12%	23%	12%
Maximum Green (s)	41.0		5.0				17.0	5.0	17.0	5.0
Yellow Time (s)	4.0		4.0				3.0	4.0	3.0	4.0
All-Red Time (s)	2.0		2.0				1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0		0.0							
Total Lost Time (s)	6.0		6.0							
Lead/Lag	Lag		Lead				Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes		Yes				Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0		3.0				3.0	3.0	3.0	3.0
Recall Mode	None		None				Min	None	Min	None
Act Effct Green (s)	41.2		27.1	27.3	29.3	79.5				
Actuated g/C Ratio	0.50		0.33	0.33	0.35	0.96				
v/c Ratio	0.89		0.03	0.49	0.34	0.25				
Control Delay	34.8		16.5	26.2	24.5	0.4				
Queue Delay	0.0		0.0	0.0	1.3	0.0				
Total Delay	34.8		16.5	26.2	25.8	0.4				
LOS	C		B	C	C	A				
Approach Delay	34.8			25.9	9.8					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø2	Ø5	Ø6	Ø7
Approach LOS	C			C	A					
Queue Length 50th (ft)	318		4	111	87	0				
Queue Length 95th (ft)	#686		13	209	141	1				
Internal Link Dist (ft)	312			624	183					
Turn Bay Length (ft)	200		100			90				
Base Capacity (vph)	893		364	614	653	1523				
Starvation Cap Reductn	0		0	0	252	166				
Spillback Cap Reductn	1		0	0	0	0				
Storage Cap Reductn	0		0	0	0	0				
Reduced v/c Ratio	0.89		0.03	0.49	0.56	0.28				

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 82.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 24.3 Intersection LOS: C
Intersection Capacity Utilization 61.7% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 19: NH 102 EB/NH 102 & Tsienneto Rd



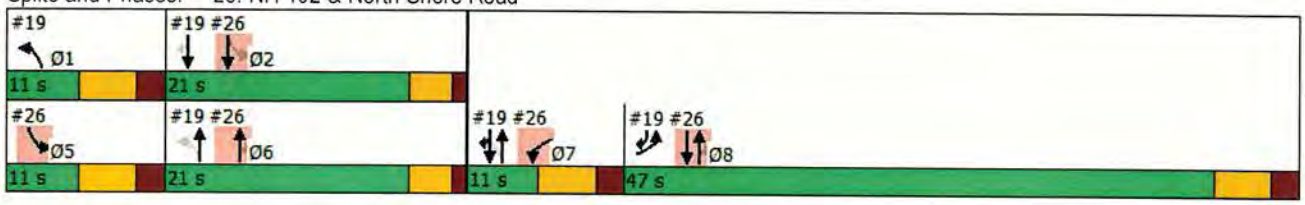
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø1	Ø2	Ø6	Ø8
Lane Configurations										
Traffic Volume (vph)	50	10	810	160	20	490				
Future Volume (vph)	50	10	810	160	20	490				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	0	0		90	100					
Storage Lanes	1	0		1	1					
Taper Length (ft)	25				25					
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00				
Frt	0.972			0.850						
Flt Protected	0.962				0.950					
Satd. Flow (prot)	1763	0	1900	1615	1805	1900				
Flt Permitted	0.962				0.219					
Satd. Flow (perm)	1763	0	1900	1615	416	1900				
Right Turn on Red		Yes		Yes						
Satd. Flow (RTOR)	11			123						
Link Speed (mph)	30		30			30				
Link Distance (ft)	524		263			288				
Travel Time (s)	11.9		6.0			6.5				
Peak Hour Factor	0.87	0.67	0.95	0.84	0.73	0.96				
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%				
Adj. Flow (vph)	57	15	853	190	27	510				
Shared Lane Traffic (%)										
Lane Group Flow (vph)	72	0	853	190	27	510				
Turn Type	Prot		NA	Perm	custom	NA				
Protected Phases	7		6 8		5	2 8	1	2	6	8
Permitted Phases				6 8	2					
Detector Phase	7		6 8	6 8	5	2 8				
Switch Phase										
Minimum Initial (s)	5.0				5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	11.0				11.0		11.0	9.0	9.0	26.5
Total Split (s)	11.0				11.0		11.0	21.0	21.0	47.0
Total Split (%)	12.2%				12.2%		12%	23%	23%	52%
Maximum Green (s)	5.0				5.0		5.0	17.0	17.0	41.0
Yellow Time (s)	4.0				4.0		4.0	3.0	3.0	4.0
All-Red Time (s)	2.0				2.0		2.0	1.0	1.0	2.0
Lost Time Adjust (s)	0.0				0.0					
Total Lost Time (s)	6.0				6.0					
Lead/Lag	Lead				Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes				Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0				3.0		3.0	3.0	3.0	3.0
Recall Mode	None				None		None	Min	Min	None
Act Effct Green (s)	5.0		62.0	62.0	17.2	64.8				
Actuated g/C Ratio	0.06		0.75	0.75	0.21	0.78				
v/c Ratio	0.62		0.60	0.15	0.16	0.34				
Control Delay	58.9		2.6	0.7	26.2	3.0				
Queue Delay	0.0		1.3	0.4	0.0	0.0				
Total Delay	58.9		3.8	1.1	26.2	3.0				
LOS	E		A	A	C	A				
Approach Delay	58.9		3.3			4.2				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø1	Ø2	Ø6	Ø8
Approach LOS	E		A			A				
Queue Length 50th (ft)	30		17	0	11	44				
Queue Length 95th (ft)	#96		m77	m2	25	65				
Internal Link Dist (ft)	444		183			208				
Turn Bay Length (ft)				90	100					
Base Capacity (vph)	117		1445	1258	170	1509				
Starvation Cap Reductn	0		359	686	0	0				
Spillback Cap Reductn	0		0	0	0	16				
Storage Cap Reductn	0		0	0	0	0				
Reduced v/c Ratio	0.62		0.79	0.33	0.16	0.34				

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 82.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 6.0 Intersection LOS: A
Intersection Capacity Utilization 55.1% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 26: NH 102 & North Shore Road



APPENDIX S-1: 2040 ALTERNATIVE F INTERSECTION CAPACITY ANALYSES – HCS PRINTOUTS – AM PEAK HOUR

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1355	685	0	855	805
Future Volume (vph)	0	1355	685	0	855	805
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		0.95	0.95		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3406		1930	2682
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3406		1930	2682
Peak-hour factor, PHF	0.93	0.93	0.88	0.88	0.89	0.89
Adj. Flow (vph)	0	1457	778	0	961	904
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1457	778	0	961	904
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		29.0	29.0		34.0	34.0
Effective Green, g (s)		29.0	29.0		34.0	34.0
Actuated g/C Ratio		0.39	0.39		0.45	0.45
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1342	1316		874	1215
v/s Ratio Prot		c0.42	0.23		c0.50	0.34
v/s Ratio Perm						
v/c Ratio		1.09	0.59		1.10	0.74
Uniform Delay, d1		23.0	18.3		20.5	16.9
Progression Factor		1.01	0.94		1.00	1.00
Incremental Delay, d2		44.9	0.2		61.4	2.5
Delay (s)		68.1	17.3		81.9	19.4
Level of Service		E	B		F	B
Approach Delay (s)		68.1	17.3		51.6	
Approach LOS		E	B		D	

Intersection Summary			
HCM 2000 Control Delay	51.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	455	0	365	0	0	1165	1045	0	0	1295	1155
Future Volume (vph)	455	0	365	0	0	1165	1045	0	0	1295	1155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0	6.0			6.0	4.0
Lane Util. Factor	0.97		0.88			0.97	0.95			0.95	1.00
Frt	1.00		0.85			1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)	3242		2632			3335	3438			3505	1568
Flt Permitted	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (perm)	3242		2632			3335	3438			3505	1568
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	517	0	415	0	0	1239	1112	0	0	1408	1255
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	517	0	415	0	0	1239	1112	0	0	1408	1255
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Actuated Green, G (s)	22.0		22.0			52.0	116.0			58.0	150.0
Effective Green, g (s)	22.0		22.0			52.0	116.0			58.0	150.0
Actuated g/C Ratio	0.15		0.15			0.35	0.77			0.39	1.00
Clearance Time (s)	6.0		6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	475		386			1156	2658			1355	1568
v/s Ratio Prot	c0.16		0.16			c0.37	0.32			c0.40	
v/s Ratio Perm											0.80
v/c Ratio	1.09		1.08			1.07	0.42			1.04	0.80
Uniform Delay, d1	64.0		64.0			49.0	5.7			46.0	0.0
Progression Factor	1.00		1.00			0.84	0.96			1.00	1.00
Incremental Delay, d2	67.3		67.3			34.3	0.0			35.2	4.4
Delay (s)	131.3		131.3			75.5	5.5			81.2	4.4
Level of Service	F		F			E	A			F	A
Approach Delay (s)		131.3		0.0			42.4			45.0	
Approach LOS		F		A			D			D	

Intersection Summary			
HCM 2000 Control Delay	57.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	98.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	795	360	390	615	0	0	0	0	495	0	500
Future Volume (vph)	0	795	360	390	615	0	0	0	0	495	0	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3167	1417	1687	3374					3303		1524
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3167	1417	1687	3374					3303		1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.73	0.73	0.73	0.92	0.92	0.92	0.74	0.74	0.74
Adj. Flow (vph)	0	864	391	534	842	0	0	0	0	669	0	676
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	124
Lane Group Flow (vph)	0	864	391	534	842	0	0	0	0	669	0	552
Heavy Vehicles (%)	14%	14%	14%	7%	7%	7%	2%	2%	2%	6%	6%	6%
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Actuated Green, G (s)		35.0	130.0	38.0	79.0					39.0		39.0
Effective Green, g (s)		35.0	130.0	38.0	79.0					39.0		39.0
Actuated g/C Ratio		0.27	1.00	0.29	0.61					0.30		0.30
Clearance Time (s)		6.0		6.0	6.0					6.0		6.0
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Lane Grp Cap (vph)		852	1417	493	2050					990		457
v/s Ratio Prot		c0.27		c0.32	0.25					0.20		c0.36
v/s Ratio Perm			0.28									
v/c Ratio		1.01	0.28	1.08	0.41					0.68		1.21
Uniform Delay, d1		47.5	0.0	46.0	13.3					39.9		45.5
Progression Factor		1.00	1.00	0.31	0.08					1.00		1.00
Incremental Delay, d2		34.4	0.5	60.7	0.3					1.8		112.7
Delay (s)		81.9	0.5	74.8	1.3					41.8		158.2
Level of Service		F	A	E	A					D		F
Approach Delay (s)		56.5			29.8			0.0			100.3	
Approach LOS		E			C			A			F	

Intersection Summary			
HCM 2000 Control Delay	62.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	605	685	0	0	625	790	380	0	160	0	0	0
Future Volume (vph)	605	685	0	0	625	790	380	0	160	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1641	3282			3438	1538	1656		1482			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1641	3282			3438	1538	1656		1482			
Peak-hour factor, PHF	0.87	0.87	0.87	0.90	0.90	0.90	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	695	787	0	0	694	878	487	0	205	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	128	0	0	0
Lane Group Flow (vph)	695	787	0	0	694	878	487	0	77	0	0	0
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	9%	9%	9%	2%	2%	2%
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Actuated Green, G (s)	51.0	83.0			26.0	130.0	35.0		35.0			
Effective Green, g (s)	51.0	83.0			26.0	130.0	35.0		35.0			
Actuated g/C Ratio	0.39	0.64			0.20	1.00	0.27		0.27			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Lane Grp Cap (vph)	643	2095			687	1538	445		399			
v/s Ratio Prot	c0.42	0.24			c0.20		c0.29		0.05			
v/s Ratio Perm						0.57						
v/c Ratio	1.08	0.38			1.01	0.57	1.09		0.19			
Uniform Delay, d1	39.5	11.2			52.0	0.0	47.5		36.6			
Progression Factor	0.22	0.00			1.00	1.00	1.00		1.00			
Incremental Delay, d2	44.0	0.3			36.9	1.5	70.7		0.2			
Delay (s)	52.6	0.3			88.9	1.5	118.2		36.9			
Level of Service	D	A			F	A	F		D			
Approach Delay (s)		24.9			40.1			94.1			0.0	
Approach LOS		C			D			F			A	

Intersection Summary			
HCM 2000 Control Delay	44.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	0	120	0	1	0	160	780	5	10	1550	40
Future Volume (vph)	10	0	120	0	1	0	160	780	5	10	1550	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00		1.00	1.00		1.00	1.00	
Flt Protected		0.95	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1770	1583		1900		1770	3536		1770	3526	
Flt Permitted		1.00	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1863	1583		1900		1770	3536		1770	3526	
Peak-hour factor, PHF	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	0	130	0	4	0	174	848	5	11	1685	43
RTOR Reduction (vph)	0	0	48	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	11	82	0	4	0	174	853	0	11	1727	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	custom		NA		Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Actuated Green, G (s)		1.3	54.2		1.3		12.6	66.0		0.8	54.2	
Effective Green, g (s)		1.3	54.2		1.3		12.6	66.0		0.8	54.2	
Actuated g/C Ratio		0.02	0.63		0.02		0.15	0.77		0.01	0.63	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		28	996		28		259	2710		16	2219	
v/s Ratio Prot					0.00		c0.10	0.24		0.01	c0.49	
v/s Ratio Perm		c0.01	0.05									
v/c Ratio		0.39	0.08		0.14		0.67	0.31		0.69	0.78	
Uniform Delay, d1		42.0	6.2		41.9		34.8	3.1		42.5	11.6	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		8.9	0.0		2.3		6.7	0.1		80.1	1.8	
Delay (s)		50.9	6.3		44.2		41.5	3.2		122.6	13.4	
Level of Service		D	A		D		D	A		F	B	
Approach Delay (s)		9.7			44.2			9.7			14.1	
Approach LOS		A			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	86.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	5	10	5	360	0	30	0	540	180	5	810	0
Future Volume (vph)	5	10	5	360	0	30	0	540	180	5	810	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0		4.5		6.0	6.0		6.0	
Lane Util. Factor		1.00		1.00		1.00		1.00	1.00		1.00	
Frt		0.97		1.00		0.85		1.00	0.85		1.00	
Flt Protected		0.99		0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)		1780		1752		1568		1759	1495		1809	
Flt Permitted		0.99		0.74		1.00		1.00	1.00		1.00	
Satd. Flow (perm)		1780		1357		1568		1759	1495		1803	
Peak-hour factor, PHF	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	8	17	8	375	0	31	0	607	202	6	942	0
RTOR Reduction (vph)	0	6	0	0	0	21	0	0	67	0	0	0
Lane Group Flow (vph)	0	27	0	375	0	10	0	607	135	0	948	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		D.Pm		Perm		NA	Perm	Perm	NA	
Protected Phases		4						2			2	
Permitted Phases	4			4		8			2	2		
Actuated Green, G (s)		25.6		25.6		27.1		50.6	50.6		50.6	
Effective Green, g (s)		25.6		25.6		27.1		50.6	50.6		50.6	
Actuated g/C Ratio		0.29		0.29		0.31		0.57	0.57		0.57	
Clearance Time (s)		6.0		6.0		4.5		6.0	6.0		6.0	
Vehicle Extension (s)		3.0		3.0		3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)		516		393		481		1009	857		1034	
v/s Ratio Prot								0.35				
v/s Ratio Perm		0.02		c0.28		0.01			0.09		c0.53	
v/c Ratio		0.05		0.95		0.02		0.60	0.16		0.92	
Uniform Delay, d1		22.6		30.7		21.3		12.2	8.8		16.9	
Progression Factor		1.00		1.00		1.00		1.00	1.00		1.00	
Incremental Delay, d2		0.0		33.5		0.0		1.0	0.1		12.4	
Delay (s)		22.6		64.2		21.3		13.3	8.9		29.3	
Level of Service		C		E		C		B	A		C	
Approach Delay (s)		22.6			60.9			12.2			29.3	
Approach LOS		C			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	88.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	270	130	30	500	200	200	100	40	100	100	120
Future Volume (vph)	130	270	130	30	500	200	200	100	40	100	100	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1656	1743	1333	1703	3260		3335	1732		1703	1792	1524
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1656	1743	1333	1703	3260		3335	1732		1703	1792	1524
Peak-hour factor, PHF	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.91	0.91	0.91
Adj. Flow (vph)	135	281	135	32	532	213	235	118	47	110	110	132
RTOR Reduction (vph)	0	0	62	0	49	0	0	16	0	0	0	98
Lane Group Flow (vph)	135	281	73	32	696	0	235	149	0	110	110	34
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	5%	5%	5%	6%	6%	6%
Parking (#/hr)			0									
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	8.1	32.3	43.1	2.1	26.3		10.8	13.9		7.1	10.2	18.3
Effective Green, g (s)	8.1	32.3	43.1	2.1	26.3		10.8	13.9		7.1	10.2	18.3
Actuated g/C Ratio	0.10	0.41	0.54	0.03	0.33		0.14	0.18		0.09	0.13	0.23
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	168	709	824	45	1079		453	303		152	230	466
v/s Ratio Prot	c0.08	c0.16	0.01	0.02	c0.21		c0.07	c0.09		0.06	0.06	0.01
v/s Ratio Perm			0.04									0.01
v/c Ratio	0.80	0.40	0.09	0.71	0.64		0.52	0.49		0.72	0.48	0.07
Uniform Delay, d1	34.9	16.7	8.7	38.3	22.6		31.9	29.6		35.2	32.1	23.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	23.5	0.4	0.0	41.4	1.3		1.0	1.2		15.6	1.6	0.1
Delay (s)	58.4	17.0	8.8	79.7	23.9		32.9	30.8		50.8	33.7	24.0
Level of Service	E	B	A	E	C		C	C		D	C	C
Approach Delay (s)		25.1			26.2			32.0			35.4	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	79.4	Sum of lost time (s)	24.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	350	20	5	40	140	440
Future Volume (vph)	350	20	5	40	140	440
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	120	0			220
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.995		
Satd. Flow (prot)	1719	1538	0	1818	1863	1583
Flt Permitted	0.950			0.995		
Satd. Flow (perm)	1719	1538	0	1818	1863	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	322			309	292	
Travel Time (s)	7.3			7.0	6.6	
Peak Hour Factor	0.89	0.89	0.91	0.91	0.93	0.93
Heavy Vehicles (%)	5%	5%	4%	4%	2%	2%
Adj. Flow (vph)	393	22	5	44	151	473
Shared Lane Traffic (%)						
Lane Group Flow (vph)	393	22	0	49	151	473
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 37.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	20.7
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	350	20	5	40	140	440
Future Vol, veh/h	350	20	5	40	140	440
Peak Hour Factor	0.89	0.89	0.91	0.91	0.93	0.93
Heavy Vehicles, %	5	5	4	4	2	2
Mvmt Flow	393	22	5	44	151	473
Number of Lanes	1	1	0	1	1	1

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	2
HCM Control Delay	26.1	10.5	17.9
HCM LOS	D	B	C

Lane	NBLn1	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	11%	100%	0%	0%	0%
Vol Thru, %	89%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	45	350	20	140	440
LT Vol	5	350	0	0	0
Through Vol	40	0	0	140	0
RT Vol	0	0	20	0	440
Lane Flow Rate	49	393	22	151	473
Geometry Grp	4	7	7	7	7
Degree of Util (X)	0.093	0.747	0.035	0.255	0.707
Departure Headway (Hd)	6.734	6.836	5.624	6.087	5.378
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	530	531	636	589	672
Service Time	4.799	4.571	3.359	3.835	3.126
HCM Lane V/C Ratio	0.092	0.74	0.035	0.256	0.704
HCM Control Delay	10.5	27.1	8.6	10.9	20.1
HCM Lane LOS	B	D	A	B	C
HCM 95th-tile Q	0.3	6.4	0.1	1	5.8

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	0	0	390	580	10
Future Volume (vph)	10	0	0	390	580	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.998	
Flt Protected	0.950					
Satd. Flow (prot)	1008	0	0	1827	1789	0
Flt Permitted	0.950					
Satd. Flow (perm)	1008	0	0	1827	1789	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	160			224	319	
Travel Time (s)	3.6			5.1	7.3	
Peak Hour Factor	0.44	0.44	0.95	0.95	0.96	0.96
Heavy Vehicles (%)	79%	79%	4%	4%	6%	6%
Adj. Flow (vph)	23	0	0	411	604	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	0	0	411	614	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 41.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	0	0	390	580	10
Future Vol, veh/h	10	0	0	390	580	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	44	44	95	95	96	96
Heavy Vehicles, %	79	79	4	4	6	6
Mvmt Flow	23	0	0	411	604	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1020	609	614	0	-	0
Stage 1	609	-	-	-	-	-
Stage 2	411	-	-	-	-	-
Critical Hdwy	7.19	6.99	4.14	-	-	-
Critical Hdwy Stg 1	6.19	-	-	-	-	-
Critical Hdwy Stg 2	6.19	-	-	-	-	-
Follow-up Hdwy	4.211	4.011	2.236	-	-	-
Pot Cap-1 Maneuver	191	379	956	-	-	-
Stage 1	419	-	-	-	-	-
Stage 2	531	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	191	379	956	-	-	-
Mov Cap-2 Maneuver	191	-	-	-	-	-
Stage 1	419	-	-	-	-	-
Stage 2	531	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.4	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	956	-	191	-	-
HCM Lane V/C Ratio	-	-	0.119	-	-
HCM Control Delay (s)	0	-	26.4	-	-
HCM Lane LOS	A	-	D	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	40	350	10	30	510	10	10	5	70	10	30	10
Future Volume (vph)	40	350	10	30	510	10	10	5	70	10	30	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		150	100		150	0		0	150		150
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.998			0.889			0.973	
Flt Protected		0.995			0.997			0.994			0.990	
Satd. Flow (prot)	0	1762	0	0	1800	0	0	1646	0	0	1830	0
Flt Permitted		0.995			0.997			0.994			0.990	
Satd. Flow (perm)	0	1762	0	0	1800	0	0	1646	0	0	1830	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		327			240			246			251	
Travel Time (s)		7.4			5.5			5.6			5.7	
Peak Hour Factor	0.89	0.89	0.89	0.96	0.96	0.96	0.65	0.65	0.65	0.67	0.67	0.67
Heavy Vehicles (%)	7%	7%	7%	5%	5%	5%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	45	393	11	31	531	10	15	8	108	15	45	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	449	0	0	572	0	0	131	0	0	75	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	40	350	10	30	510	10	10	5	70	10	30	10
Future Vol, veh/h	40	350	10	30	510	10	10	5	70	10	30	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	96	96	96	65	65	65	67	67	67
Heavy Vehicles, %	7	7	7	5	5	5	2	2	2	0	0	0
Mvmt Flow	45	393	11	31	531	10	15	8	108	15	45	15

Major/Minor	Major1			Major2			Minor2			Minor1		
Conflicting Flow All	541	0	0	404	0	0	1117	1092	536	1091	1092	399
Stage 1	-	-	-	-	-	-	598	598	-	489	489	-
Stage 2	-	-	-	-	-	-	519	494	-	602	603	-
Critical Hdwy	4.17	-	-	4.15	-	-	7.12	6.52	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Follow-up Hdwy	2.263	-	-	2.245	-	-	3.518	4.018	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	1003	-	-	1139	-	-	185	215	545	194	216	655
Stage 1	-	-	-	-	-	-	489	491	-	564	553	-
Stage 2	-	-	-	-	-	-	540	546	-	490	492	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1003	-	-	1139	-	-	138	195	545	140	195	655
Mov Cap-2 Maneuver	-	-	-	-	-	-	138	195	-	140	195	-
Stage 1	-	-	-	-	-	-	461	472	-	531	521	-
Stage 2	-	-	-	-	-	-	454	514	-	372	473	-

Approach	EB	WB	SE	NW
HCM Control Delay, s	0.9	0.5	11.8	31.7
HCM LOS			B	D

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	WBL	WBT	WBR	SELn1
Capacity (veh/h)	208	1003	-	-	1139	-	-	662
HCM Lane V/C Ratio	0.359	0.045	-	-	0.027	-	-	0.198
HCM Control Delay (s)	31.7	8.8	0	-	8.2	0	-	11.8
HCM Lane LOS	D	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.5	0.1	-	-	0.1	-	-	0.7

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	120	180	240	100	0	90	260	20	145	430	345
Future Volume (vph)	20	120	180	240	100	0	90	260	20	145	430	345
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	3471	1553	3335	3438		1752	1845	1568	1752	1845	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1736	3471	1553	3335	3438		1752	1845	1568	1752	1845	1568
Peak-hour factor, PHF	0.84	0.84	0.84	0.79	0.79	0.79	0.86	0.86	0.86	0.99	0.99	0.99
Adj. Flow (vph)	24	143	214	304	127	0	105	302	23	146	434	348
RTOR Reduction (vph)	0	0	166	0	0	0	0	0	0	0	0	176
Lane Group Flow (vph)	24	143	48	304	127	0	105	302	23	146	434	172
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	5	2		1	6		7	4		3	8	8 1
Permitted Phases		2	2		6			4	Free		8	
Actuated Green, G (s)	11.9	20.2	20.2	11.5	19.8		7.2	22.9	90.0	11.4	27.1	44.6
Effective Green, g (s)	11.9	20.2	20.2	11.5	19.8		7.2	22.9	90.0	11.4	27.1	44.6
Actuated g/C Ratio	0.13	0.22	0.22	0.13	0.22		0.08	0.25	1.00	0.13	0.30	0.50
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	229	779	348	426	756		140	469	1568	221	555	777
v/s Ratio Prot	0.01	c0.04		c0.09	0.04		0.06	0.16		c0.08	c0.24	0.11
v/s Ratio Perm			0.03						c0.01			
v/c Ratio	0.10	0.18	0.14	0.71	0.17		0.75	0.64	0.01	0.66	0.78	0.22
Uniform Delay, d1	34.4	28.2	27.9	37.7	28.4		40.5	29.9	0.0	37.5	28.7	12.9
Progression Factor	1.00	1.00	1.00	1.04	0.86		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.5	0.8	5.5	0.5		20.0	3.0	0.0	7.2	7.1	0.1
Delay (s)	35.3	28.7	28.8	44.5	24.8		60.5	32.9	0.0	44.7	35.8	13.0
Level of Service	D	C	C	D	C		E	C	A	D	D	B
Approach Delay (s)		29.2			38.7			37.9			28.7	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	80	60	460	220	70	840
Future Volume (vph)	80	60	460	220	70	840
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	180	0		0	180	
Storage Lanes	1	1		1	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.850		0.850		
Flt Protected	0.950					0.996
Satd. Flow (prot)	1770	1583	1845	1568	0	3525
Flt Permitted	0.950					0.996
Satd. Flow (perm)	1770	1583	1845	1568	0	3525
Link Speed (mph)	30		30			30
Link Distance (ft)	408		387			233
Travel Time (s)	9.3		8.8			5.3
Peak Hour Factor	0.83	0.83	0.86	0.86	0.81	0.81
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Adj. Flow (vph)	96	72	535	256	86	1037
Shared Lane Traffic (%)						
Lane Group Flow (vph)	96	72	535	256	0	1123
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.9%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	4.2

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	80	60	460	220	70	840
Future Vol, veh/h	80	60	460	220	70	840
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	180	0	-	0	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	83	83	86	86	81	81
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	96	72	535	256	86	1037

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1226	535	0	0	535	0
Stage 1	535	-	-	-	-	-
Stage 2	691	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	184	544	-	-	1031	-
Stage 1	586	-	-	-	-	-
Stage 2	460	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	148	544	-	-	1031	-
Mov Cap-2 Maneuver	148	-	-	-	-	-
Stage 1	471	-	-	-	-	-
Stage 2	460	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	43.2	0	1.3
HCM LOS	E		

Minor Lane/Major Mvmt	NET	NER	NWLn1	NWLn2	SWL	SWT
Capacity (veh/h)	-	-	148	544	1031	-
HCM Lane V/C Ratio	-	-	0.651	0.133	0.084	-
HCM Control Delay (s)	-	-	66.1	12.6	8.8	0.7
HCM Lane LOS	-	-	F	B	A	A
HCM 95th %tile Q(veh)	-	-	3.6	0.5	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	40	580	0	0	470	20	5	0	5	20	0	130
Future Volume (vph)	40	580	0	0	470	20	5	0	5	20	0	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00			0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00			1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1687	3374			3517			1805	1615		1787	1599
Flt Permitted	0.95	1.00			1.00			0.74	1.00		0.75	1.00
Satd. Flow (perm)	1687	3374			3517			1412	1615		1413	1599
Peak-hour factor, PHF	0.83	0.83	0.83	0.92	0.92	0.92	0.50	0.50	0.50	0.90	0.90	0.90
Adj. Flow (vph)	48	699	0	0	511	22	10	0	10	22	0	144
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	9	0	0	132
Lane Group Flow (vph)	48	699	0	0	531	0	0	10	1	0	22	12
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases					6		8	8	8	4		4
Actuated Green, G (s)	5.6	70.5			58.9			7.5	7.5		7.5	7.5
Effective Green, g (s)	5.6	70.5			58.9			7.5	7.5		7.5	7.5
Actuated g/C Ratio	0.06	0.78			0.65			0.08	0.08		0.08	0.08
Clearance Time (s)	6.0	6.0			6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	104	2642			2301			117	134		117	133
v/s Ratio Prot	c0.03	c0.21			0.15							
v/s Ratio Perm								0.01	0.00		c0.02	0.01
v/c Ratio	0.46	0.26			0.23			0.09	0.01		0.19	0.09
Uniform Delay, d1	40.7	2.7			6.3			38.1	37.8		38.4	38.1
Progression Factor	0.89	1.66			1.25			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.1	0.2			0.0			0.3	0.0		0.8	0.3
Delay (s)	39.2	4.7			8.0			38.4	37.9		39.2	38.4
Level of Service	D	A			A			D	D		D	D
Approach Delay (s)		6.9			8.0			38.1			38.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	470	5	5	450	160	10	5	5	180	5	100
Future Volume (vph)	70	470	5	5	450	160	10	5	5	180	5	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00		1.00	0.96		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	3303	3400		1736	3335		1805	1758		1665	1674	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	3303	3400		1736	3335		1805	1758		1665	1674	1568
Peak-hour factor, PHF	0.83	0.83	0.83	0.97	0.97	0.97	0.67	0.67	0.67	0.90	0.90	0.90
Adj. Flow (vph)	84	566	6	5	464	165	15	7	7	200	6	111
RTOR Reduction (vph)	0	1	0	0	41	0	0	7	0	0	0	80
Lane Group Flow (vph)	84	571	0	5	588	0	15	7	0	102	104	31
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases								3				
Actuated Green, G (s)	7.7	49.1		1.3	42.7		4.1	4.1		11.5	11.5	25.2
Effective Green, g (s)	7.7	49.1		1.3	42.7		4.1	4.1		11.5	11.5	25.2
Actuated g/C Ratio	0.09	0.55		0.01	0.47		0.05	0.05		0.13	0.13	0.28
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	282	1854		25	1582		82	80		212	213	439
v/s Ratio Prot	c0.03	c0.17		0.00	c0.18		c0.01	0.00		0.06	c0.06	0.02
v/s Ratio Perm												
v/c Ratio	0.30	0.31		0.20	0.37		0.18	0.09		0.48	0.49	0.07
Uniform Delay, d1	38.6	11.2		43.8	15.1		41.3	41.2		36.5	36.5	23.8
Progression Factor	1.00	1.00		1.58	0.57		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1		3.9	0.7		1.1	0.5		1.7	1.8	0.1
Delay (s)	39.2	11.3		73.0	9.3		42.4	41.7		38.2	38.3	23.9
Level of Service	D	B		E	A		D	D		D	D	C
Approach Delay (s)		14.8			9.8			42.1			33.2	
Approach LOS		B			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	10	590	470	20	40	20
Future Volume (vph)	10	590	470	20	40	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	140			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.995		0.955	
Flt Protected	0.950				0.968	
Satd. Flow (prot)	1687	1776	1818	0	1657	0
Flt Permitted	0.950				0.968	
Satd. Flow (perm)	1687	1776	1818	0	1657	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		535	210		522	
Travel Time (s)		12.2	4.8		11.9	
Peak Hour Factor	0.84	0.84	0.89	0.89	0.83	0.83
Heavy Vehicles (%)	7%	7%	4%	4%	6%	6%
Adj. Flow (vph)	12	702	528	22	48	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	702	550	0	72	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 41.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	590	470	20	40	20
Future Vol, veh/h	10	590	470	20	40	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	140	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	89	89	83	83
Heavy Vehicles, %	7	7	4	4	6	6
Mvmt Flow	12	702	528	22	48	24

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	550	0	-	0	1265	539
Stage 1	-	-	-	-	539	-
Stage 2	-	-	-	-	726	-
Critical Hdwy	4.17	-	-	-	6.46	6.26
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.263	-	-	-	3.554	3.354
Pot Cap-1 Maneuver	995	-	-	-	183	535
Stage 1	-	-	-	-	577	-
Stage 2	-	-	-	-	472	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	995	-	-	-	181	535
Mov Cap-2 Maneuver	-	-	-	-	181	-
Stage 1	-	-	-	-	570	-
Stage 2	-	-	-	-	472	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	27.4
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	995	-	-	-	232
HCM Lane V/C Ratio	0.012	-	-	-	0.312
HCM Control Delay (s)	8.7	-	-	-	27.4
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	1.3

Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	340	210	20	90	90	40	5	10	100	110	40
Future Volume (vph)	10	340	210	20	90	90	40	5	10	100	110	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	150		0		150			0		0
Storage Lanes		1	0		0		0			0		0
Taper Length (ft)		25			25					25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.946				0.973					0.979	
Flt Protected		0.971				0.980					0.979	
Satd. Flow (prot)	0	1694	0	0	0	1759	0	0	0	0	1702	0
Flt Permitted		0.971				0.980					0.979	
Satd. Flow (perm)	0	1694	0	0	0	1759	0	0	0	0	1702	0
Link Speed (mph)		30				30					30	
Link Distance (ft)		465				456					371	
Travel Time (s)		10.6				10.4					8.4	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.86	0.86	0.86	0.86	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	7%	7%	7%	7%
Adj. Flow (vph)	11	374	231	22	105	105	47	6	13	125	138	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	638	0	0	0	263	0	0	0	0	326	0
Sign Control		Yield				Yield					Yield	

Intersection Summary			
Area Type:	Other		
Control Type: Roundabout			
Intersection Capacity Utilization 97.3%		ICU Level of Service F	
Analysis Period (min) 15			

Lane Group	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR
Lane Configurations		↕					↕	
Traffic Volume (vph)	70	130	120	140	5	40	220	10
Future Volume (vph)	70	130	120	140	5	40	220	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150			150		0
Storage Lanes	0		0			0		0
Taper Length (ft)	25					25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.924					0.995	
Flt Protected		0.992					0.992	
Satd. Flow (prot)	0	1613	0	0	0	0	1753	0
Flt Permitted		0.992					0.992	
Satd. Flow (perm)	0	1613	0	0	0	0	1753	0
Link Speed (mph)		30					30	
Link Distance (ft)		400					530	
Travel Time (s)		9.1					12.0	
Peak Hour Factor	0.60	0.60	0.60	0.60	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	8%	8%	8%	8%	7%	7%	7%	7%
Adj. Flow (vph)	117	217	200	233	6	48	265	12
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	767	0	0	0	0	331	0
Sign Control		Yield					Yield	

Intersection Summary

Intersection	
Intersection Delay, s/veh	28.2
Intersection LOS	D

Approach	WB	NB	SB	NE	SW
Entry Lanes	1	1	1	1	1
Conflicting Circle Lanes	1	1	1	1	1
Adj Approach Flow, veh/h	638	263	326	767	331
Demand Flow Rate, veh/h	657	270	350	828	354
Vehicles Circulating, veh/h	638	730	845	364	976
Vehicles Exiting, veh/h	362	462	485	831	319
Ped Vol Crossing Leg, #/h	0	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000	1.000
Approach Delay, s/veh	40.1	11.6	19.1	28.7	26.4
Approach LOS	E	B	C	D	D

Lane	Left	Left	Left	Left	Left
Designated Moves	LR	LTR	LTR	LTR	LTR
Assumed Moves	LR	LTR	LTR	LTR	LTR
RT Channelized					
Lane Util	1.000	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
Entry Flow, veh/h	657	270	350	828	354
Cap Entry Lane, veh/h	720	655	583	952	510
Entry HV Adj Factor	0.971	0.974	0.933	0.926	0.935
Flow Entry, veh/h	638	263	326	767	331
Cap Entry, veh/h	699	638	544	881	477
V/C Ratio	0.913	0.412	0.600	0.870	0.694
Control Delay, s/veh	40.1	11.6	19.1	28.7	26.4
LOS	E	B	C	D	D
95th %tile Queue, veh	12	2	4	11	5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	10	145	5	40	50	200	170	10	10	110	20
Future Volume (vph)	10	10	145	5	40	50	200	170	10	10	110	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.929			0.997			0.981	
Flt Protected		0.976			0.997			0.974			0.996	
Satd. Flow (prot)	0	1717	1495	0	1676	0	0	1791	0	0	1785	0
Flt Permitted		0.976			0.997			0.974			0.996	
Satd. Flow (perm)	0	1717	1495	0	1676	0	0	1791	0	0	1785	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		144			453			475			436	
Travel Time (s)		3.3			10.3			10.8			9.9	
Peak Hour Factor	0.82	0.82	0.82	0.70	0.70	0.70	0.75	0.75	0.75	0.71	0.71	0.71
Heavy Vehicles (%)	8%	8%	8%	5%	5%	5%	3%	3%	3%	4%	4%	4%
Adj. Flow (vph)	12	12	177	7	57	71	267	227	13	14	155	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	24	177	0	135	0	0	507	0	0	197	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	8.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↕			↕			↕	
Traffic Vol, veh/h	10	10	145	5	40	50	200	170	10	10	110	20
Future Vol, veh/h	10	10	145	5	40	50	200	170	10	10	110	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	70	70	70	75	75	75	71	71	71
Heavy Vehicles, %	8	8	8	5	5	5	3	3	3	4	4	4
Mvmt Flow	12	12	177	7	57	71	267	227	13	14	155	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1029	971	169	1060	979	234	183	0	0	240	0	0
Stage 1	197	197	-	768	768	-	-	-	-	-	-	-
Stage 2	832	774	-	292	211	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.15	6.55	6.25	4.13	-	-	4.14	-	-
Critical Hdwy Stg 1	6.18	5.58	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.545	4.045	3.345	2.227	-	-	2.236	-	-
Pot Cap-1 Maneuver	207	247	860	199	247	798	1386	-	-	1315	-	-
Stage 1	791	727	-	390	407	-	-	-	-	-	-	-
Stage 2	355	400	-	710	722	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	120	190	860	124	190	798	1386	-	-	1315	-	-
Mov Cap-2 Maneuver	120	190	-	124	190	-	-	-	-	-	-	-
Stage 1	615	718	-	303	316	-	-	-	-	-	-	-
Stage 2	206	311	-	548	713	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.2	26.2	4.3	0.6
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1386	-	-	147	860	303	1315	-	-
HCM Lane V/C Ratio	0.192	-	-	0.166	0.206	0.448	0.011	-	-
HCM Control Delay (s)	8.2	0	-	34.3	10.3	26.2	7.8	0	-
HCM Lane LOS	A	A	-	D	B	D	A	A	-
HCM 95th %tile Q(veh)	0.7	-	-	0.6	0.8	2.2	0	-	-

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	50	20	20	50	160	80	240	80	80	520	50
Future Volume (vph)	30	50	20	20	50	160	80	240	80	80	520	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1767		1736	1827	1553	1770	1793		1787	1856	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1767		1736	1827	1553	1770	1793		1787	1856	
Peak-hour factor, PHF	0.82	0.82	0.82	0.81	0.81	0.81	0.68	0.68	0.68	0.78	0.78	0.78
Adj. Flow (vph)	37	61	24	25	62	198	118	353	118	103	667	64
RTOR Reduction (vph)	0	17	0	0	0	139	0	14	0	0	4	0
Lane Group Flow (vph)	37	68	0	25	62	59	118	457	0	103	727	0
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	4.4	10.7		3.0	9.3	23.4	8.1	35.0		6.2	33.1	
Effective Green, g (s)	4.4	10.7		3.0	9.3	23.4	8.1	35.0		6.2	33.1	
Actuated g/C Ratio	0.06	0.14		0.04	0.12	0.30	0.10	0.44		0.08	0.42	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	97	239		66	215	460	181	795		140	778	
v/s Ratio Prot	c0.02	c0.04		0.01	0.03	0.04	c0.07	0.25		0.06	c0.39	
v/s Ratio Perm												
v/c Ratio	0.38	0.28		0.38	0.29	0.13	0.65	0.57		0.74	0.93	
Uniform Delay, d1	35.9	30.7		37.0	31.8	20.3	34.0	16.4		35.5	21.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.5	0.7		3.6	3.4	0.1	8.1	1.0		18.1	18.1	
Delay (s)	38.4	31.3		40.7	35.1	20.4	42.2	17.4		53.6	40.0	
Level of Service	D	C		D	D	C	D	B		D	D	
Approach Delay (s)		33.5			25.4			22.4			41.7	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	32.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	78.9	Sum of lost time (s)	24.0
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	170	0	10	140	250	470
Future Volume (vph)	170	0	10	140	250	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.912	
Flt Protected	0.950			0.997		
Satd. Flow (prot)	1770	0	0	1707	1699	0
Flt Permitted	0.950			0.997		
Satd. Flow (perm)	1770	0	0	1707	1699	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	348			739	425	
Travel Time (s)	7.9			16.8	9.7	
Peak Hour Factor	0.94	0.94	0.91	0.91	0.82	0.82
Heavy Vehicles (%)	2%	2%	11%	11%	2%	2%
Adj. Flow (vph)	181	0	11	154	305	573
Shared Lane Traffic (%)						
Lane Group Flow (vph)	181	0	0	165	878	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 58.1%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	170	0	10	140	250	470
Future Vol, veh/h	170	0	10	140	250	470
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	91	91	82	82
Heavy Vehicles, %	2	2	11	11	2	2
Mvmt Flow	181	0	11	154	305	573

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	768	592	878	0	-	0
Stage 1	592	-	-	-	-	-
Stage 2	176	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.21	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.299	-	-	-
Pot Cap-1 Maneuver	370	506	733	-	-	-
Stage 1	553	-	-	-	-	-
Stage 2	855	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	364	506	733	-	-	-
Mov Cap-2 Maneuver	364	-	-	-	-	-
Stage 1	544	-	-	-	-	-
Stage 2	855	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.3	0.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	733	-	364	-	-
HCM Lane V/C Ratio	0.015	-	0.497	-	-
HCM Control Delay (s)	10	0	24.3	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	2.7	-	-

APPENDIX S-2: 2040 ALTERNATIVE F INTERSECTION CAPACITY ANALYSES – HCS PRINTOUTS – PM PEAK HOUR

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1310	1330	0	1005	1135
Future Volume (vph)	0	1310	1330	0	1005	1135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		6.0	6.0		6.0	6.0
Lane Util. Factor		0.95	0.95		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3471	3406		1930	2682
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3471	3406		1930	2682
Peak-hour factor, PHF	0.93	0.93	0.88	0.88	0.89	0.89
Adj. Flow (vph)	0	1409	1511	0	1129	1275
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1409	1511	0	1129	1275
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		48.0	48.0		60.0	60.0
Effective Green, g (s)		48.0	48.0		60.0	60.0
Actuated g/C Ratio		0.40	0.40		0.50	0.50
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1388	1362		965	1341
v/s Ratio Prot		0.41	c0.44		c0.59	0.48
v/s Ratio Perm						
v/c Ratio		1.02	1.11		1.17	0.95
Uniform Delay, d1		36.0	36.0		30.0	28.6
Progression Factor		0.59	0.05		1.00	1.00
Incremental Delay, d2		21.8	50.4		87.7	14.4
Delay (s)		43.0	52.2		117.7	43.0
Level of Service		D	D		F	D
Approach Delay (s)		43.0	52.2		78.1	
Approach LOS		D	D		E	

Intersection Summary			
HCM 2000 Control Delay	61.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	104.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	1250	0	1105	0	0	985	1330	0	0	570	795
Future Volume (vph)	1250	0	1105	0	0	985	1330	0	0	570	795
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0			6.0	6.0			6.0	4.0
Lane Util. Factor	0.97		0.88			0.97	0.95			0.95	1.00
Frt	1.00		0.85			1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)	3242		2632			3335	3438			3505	1568
Flt Permitted	0.95		1.00			0.95	1.00			1.00	1.00
Satd. Flow (perm)	3242		2632			3335	3438			3505	1568
Peak-hour factor, PHF	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	1420	0	1256	0	0	1048	1415	0	0	620	864
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1420	0	1256	0	0	1048	1415	0	0	620	864
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Actuated Green, G (s)	44.0		44.0			32.0	64.0			26.0	120.0
Effective Green, g (s)	44.0		44.0			32.0	64.0			26.0	120.0
Actuated g/C Ratio	0.37		0.37			0.27	0.53			0.22	1.00
Clearance Time (s)	6.0		6.0			6.0	6.0			6.0	
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)	1188		965			889	1833			759	1568
v/s Ratio Prot	0.44		c0.48			c0.31	c0.41			0.18	
v/s Ratio Perm											0.55
v/c Ratio	1.20		1.30			1.18	0.77			0.82	0.55
Uniform Delay, d1	38.0		38.0			44.0	22.2			44.7	0.0
Progression Factor	1.00		1.00			0.87	0.91			1.00	1.00
Incremental Delay, d2	96.3		143.3			81.7	0.3			9.5	1.4
Delay (s)	134.3		181.3			120.1	20.5			54.2	1.4
Level of Service	F		F			F	C			D	A
Approach Delay (s)		156.4		0.0			62.9			23.5	
Approach LOS		F		A			E			C	

Intersection Summary			
HCM 2000 Control Delay	91.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	925	385	240	525	0	0	0	0	740	0	480
Future Volume (vph)	0	925	385	240	525	0	0	0	0	740	0	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0		6.0
Lane Util. Factor		0.95	1.00	1.00	0.95					0.97		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3471	1553	1719	3438					3367		1553
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3471	1553	1719	3438					3367		1553
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	0	1063	443	279	610	0	0	0	0	813	0	527
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	218
Lane Group Flow (vph)	0	1063	443	279	610	0	0	0	0	813	0	309
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Actuated Green, G (s)		36.6	100.0	18.4	61.0					27.0		27.0
Effective Green, g (s)		36.6	100.0	18.4	61.0					27.0		27.0
Actuated g/C Ratio		0.37	1.00	0.18	0.61					0.27		0.27
Clearance Time (s)		6.0		6.0	6.0					6.0		6.0
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Lane Grp Cap (vph)		1270	1553	316	2097					909		419
v/s Ratio Prot		c0.31		c0.16	0.18					c0.24		0.20
v/s Ratio Perm			0.29									
v/c Ratio		0.84	0.29	0.88	0.29					0.89		0.74
Uniform Delay, d1		29.0	0.0	39.8	9.2					35.1		33.3
Progression Factor		1.00	1.00	0.20	0.00					1.00		1.00
Incremental Delay, d2		6.7	0.5	16.3	0.2					11.2		6.7
Delay (s)		35.6	0.5	24.2	0.2					46.3		40.0
Level of Service		D	A	C	A					D		D
Approach Delay (s)		25.3			7.7			0.0			43.8	
Approach LOS		C			A			A			D	

Intersection Summary				
HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	76.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	580	1085	0	0	470	560	295	0	360	0	0	0
Future Volume (vph)	580	1085	0	0	470	560	295	0	360	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1752	3505			3505	1568	1703		1524			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1752	3505			3505	1568	1703		1524			
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.67	0.67	0.67	0.92	0.92	0.92
Adj. Flow (vph)	630	1179	0	0	516	615	440	0	537	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	71	0	0	0
Lane Group Flow (vph)	630	1179	0	0	516	615	440	0	466	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	6%	6%	6%	2%	2%	2%
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Actuated Green, G (s)	35.0	60.0			19.0	100.0	28.0		28.0			
Effective Green, g (s)	35.0	60.0			19.0	100.0	28.0		28.0			
Actuated g/C Ratio	0.35	0.60			0.19	1.00	0.28		0.28			
Clearance Time (s)	6.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Lane Grp Cap (vph)	613	2103			665	1568	476		426			
v/s Ratio Prot	c0.36	0.34			c0.15		0.26		c0.31			
v/s Ratio Perm						0.39						
v/c Ratio	1.03	0.56			0.78	0.39	0.92		1.09			
Uniform Delay, d1	32.5	12.1			38.5	0.0	35.0		36.0			
Progression Factor	0.20	0.22			1.00	1.00	1.00		1.00			
Incremental Delay, d2	33.7	0.5			8.6	0.7	23.7		71.7			
Delay (s)	40.2	3.2			47.1	0.7	58.7		107.7			
Level of Service	D	A			D	A	E		F			
Approach Delay (s)		16.1			21.9			85.7			0.0	
Approach LOS		B			C			F			A	

Intersection Summary			
HCM 2000 Control Delay	35.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	5	160	10	0	10	650	1440	120	10	1020	50
Future Volume (vph)	10	5	160	10	0	10	650	1440	120	10	1020	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.93		1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1801	1583		1729		1770	3498		1770	3515	
Flt Permitted		0.74	1.00		0.83		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1378	1583		1477		1770	3498		1770	3515	
Peak-hour factor, PHF	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	5	174	40	0	40	707	1565	130	11	1109	54
RTOR Reduction (vph)	0	0	106	0	76	0	0	3	0	0	2	0
Lane Group Flow (vph)	0	16	68	0	4	0	707	1692	0	11	1161	0
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	custom	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Actuated Green, G (s)		5.7	48.0		5.7		51.1	98.1		1.0	48.0	
Effective Green, g (s)		5.7	48.0		5.7		51.1	98.1		1.0	48.0	
Actuated g/C Ratio		0.05	0.39		0.05		0.42	0.80		0.01	0.39	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		63	618		68		736	2794		14	1373	
v/s Ratio Prot							c0.40	0.48		0.01	c0.33	
v/s Ratio Perm		c0.01	0.04		0.00							
v/c Ratio		0.25	0.11		0.05		0.96	0.61		0.79	0.85	
Uniform Delay, d1		56.5	23.8		56.0		34.9	4.8		60.8	34.0	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.1	0.1		0.3		23.8	0.4		130.6	5.0	
Delay (s)		58.6	23.9		56.3		58.7	5.2		191.4	39.0	
Level of Service		E	C		E		E	A		F	D	
Approach Delay (s)		26.8			56.3			20.9			40.4	
Approach LOS		C			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	122.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	30	5	260	0	50	0	1020	220	15	555	0
Future Volume (vph)	10	30	5	260	0	50	0	1020	220	15	555	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0		4.5		6.0	6.0		6.0	
Lane Util. Factor		1.00		1.00		1.00		1.00	1.00		1.00	
Frt		0.99		1.00		0.85		1.00	0.85		1.00	
Flt Protected		0.99		0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)		1815		1752		1568		1759	1495		1807	
Flt Permitted		0.99		0.80		1.00		1.00	1.00		0.72	
Satd. Flow (perm)		1815		1469		1568		1759	1495		1295	
Peak-hour factor, PHF	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	17	50	8	271	0	52	0	1146	247	17	645	0
RTOR Reduction (vph)	0	5	0	0	0	38	0	0	43	0	0	0
Lane Group Flow (vph)	0	70	0	271	0	14	0	1146	204	0	662	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Turn Type	Perm	NA		D.Pm		Perm		NA	Perm	Perm	NA	
Protected Phases		4						2			2	
Permitted Phases	4			4		8			2	2		
Actuated Green, G (s)		17.9		17.9		19.4		60.1	60.1		60.1	
Effective Green, g (s)		17.9		17.9		19.4		60.1	60.1		60.1	
Actuated g/C Ratio		0.20		0.20		0.22		0.67	0.67		0.67	
Clearance Time (s)		6.0		6.0		4.5		6.0	6.0		6.0	
Vehicle Extension (s)		3.0		3.0		3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)		360		292		337		1174	998		864	
v/s Ratio Prot								c0.65				
v/s Ratio Perm		0.04		c0.18		0.01			0.14		0.51	
v/c Ratio		0.19		0.93		0.04		0.98	0.20		0.77	
Uniform Delay, d1		30.0		35.4		27.9		14.3	5.8		10.2	
Progression Factor		1.00		1.00		1.00		1.00	1.00		1.00	
Incremental Delay, d2		0.3		33.9		0.0		20.5	0.1		4.1	
Delay (s)		30.3		69.3		28.0		34.8	5.9		14.3	
Level of Service		C		E		C		C	A		B	
Approach Delay (s)		30.3			62.7			29.7			14.3	
Approach LOS		C			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	230	110	30	180	150	180	170	540	130	70	330	180
Future Volume (vph)	230	110	30	180	150	180	170	540	130	70	330	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3400	1785		1752	1845	1568	1787	1881	1599	1787	3385	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3400	1785		1752	1845	1568	1787	1881	1599	1787	3385	
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95	0.94	0.94	0.94
Adj. Flow (vph)	253	121	33	194	161	194	179	568	137	74	351	191
RTOR Reduction (vph)	0	13	0	0	0	106	0	0	71	0	84	0
Lane Group Flow (vph)	253	141	0	194	161	88	179	568	66	74	458	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	3	8		7	4	5	5	2	3	1	6	
Permitted Phases						4			2			
Actuated Green, G (s)	10.0	12.0		10.8	12.8	22.7	9.9	27.3	37.3	3.8	21.2	
Effective Green, g (s)	10.0	12.0		10.8	12.8	22.7	9.9	27.3	37.3	3.8	21.2	
Actuated g/C Ratio	0.13	0.15		0.14	0.16	0.29	0.13	0.35	0.48	0.05	0.27	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	436	274		242	303	577	227	659	888	87	921	
v/s Ratio Prot	0.07	0.08		c0.11	c0.09	0.02	c0.10	c0.30	0.01	0.04	0.14	
v/s Ratio Perm						0.04			0.03			
v/c Ratio	0.58	0.52		0.80	0.53	0.15	0.79	0.86	0.07	0.85	0.50	
Uniform Delay, d1	32.0	30.3		32.5	29.8	20.5	33.0	23.5	11.0	36.8	23.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.0	1.6		17.1	1.8	0.1	16.4	13.9	0.0	50.9	0.4	
Delay (s)	33.9	31.9		49.7	31.6	20.6	49.4	37.5	11.0	87.7	24.3	
Level of Service	C	C		D	C	C	D	D	B	F	C	
Approach Delay (s)		33.2			34.1			35.8			31.9	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	34.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	77.9	Sum of lost time (s)	24.0
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	810	10	5	100	125	470
Future Volume (vph)	810	10	5	100	125	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	120	0			220
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.998		
Satd. Flow (prot)	1787	1599	0	1859	1881	1599
Flt Permitted	0.950			0.998		
Satd. Flow (perm)	1787	1599	0	1859	1881	1599
Link Speed (mph)	30			30	30	
Link Distance (ft)	322			309	354	
Travel Time (s)	7.3			7.0	8.0	
Peak Hour Factor	0.90	0.90	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	1%	2%	2%	1%	1%
Adj. Flow (vph)	900	11	6	115	144	540
Shared Lane Traffic (%)						
Lane Group Flow (vph)	900	11	0	121	144	540
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.6%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	225.6
Intersection LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	810	10	5	100	125	470
Future Vol, veh/h	810	10	5	100	125	470
Peak Hour Factor	0.90	0.90	0.87	0.87	0.87	0.87
Heavy Vehicles, %	1	1	2	2	1	1
Mvmt Flow	900	11	6	115	144	540
Number of Lanes	1	1	0	1	1	1

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	2
HCM Control Delay	392	15.5	40.9
HCM LOS	F	C	E

Lane	NBLn1	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	5%	100%	0%	0%	0%
Vol Thru, %	95%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	105	810	10	125	470
LT Vol	5	810	0	0	0
Through Vol	100	0	0	125	0
RT Vol	0	0	10	0	470
Lane Flow Rate	121	900	11	144	540
Geometry Grp	4	7	7	7	7
Degree of Util (X)	0.244	1.825	0.019	0.266	0.896
Departure Headway (Hd)	9.45	7.298	6.08	8.544	7.82
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	383	504	592	424	470
Service Time	7.45	4.998	3.78	6.244	5.52
HCM Lane V/C Ratio	0.316	1.786	0.019	0.34	1.149
HCM Control Delay	15.5	396.7	8.9	14.3	48
HCM Lane LOS	C	F	A	B	E
HCM 95th-tile Q	0.9	56.8	0.1	1.1	9.8

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	0	0	910	595	10
Future Volume (vph)	10	0	0	910	595	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.998	
Flt Protected	0.950					
Satd. Flow (prot)	1703	0	0	1881	1877	0
Flt Permitted	0.950					
Satd. Flow (perm)	1703	0	0	1881	1877	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	160			224	319	
Travel Time (s)	3.6			5.1	7.3	
Peak Hour Factor	0.50	0.50	0.93	0.93	0.86	0.86
Heavy Vehicles (%)	6%	6%	1%	1%	1%	1%
Adj. Flow (vph)	20	0	0	978	692	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	0	0	978	704	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	0	0	910	595	10
Future Vol, veh/h	10	0	0	910	595	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	93	93	86	86
Heavy Vehicles, %	6	6	1	1	1	1
Mvmt Flow	20	0	0	978	692	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1676	698	704	0	-	0
Stage 1	698	-	-	-	-	-
Stage 2	978	-	-	-	-	-
Critical Hdwy	6.46	6.26	4.11	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.354	2.209	-	-	-
Pot Cap-1 Maneuver	102	434	898	-	-	-
Stage 1	486	-	-	-	-	-
Stage 2	358	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	102	434	898	-	-	-
Mov Cap-2 Maneuver	102	-	-	-	-	-
Stage 1	486	-	-	-	-	-
Stage 2	358	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	48.7	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	898	-	102	-	-
HCM Lane V/C Ratio	-	-	0.196	-	-
HCM Control Delay (s)	0	-	48.7	-	-
HCM Lane LOS	A	-	E	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	50	860	10	40	460	20	40	10	140	5	40	10
Future Volume (vph)	50	860	10	40	460	20	40	10	140	5	40	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		150	100		150	0		0	150		150
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.995			0.901			0.976	
Flt Protected		0.997			0.996			0.990			0.996	
Satd. Flow (prot)	0	1872	0	0	1846	0	0	1695	0	0	1847	0
Flt Permitted		0.997			0.996			0.990			0.996	
Satd. Flow (perm)	0	1872	0	0	1846	0	0	1695	0	0	1847	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		327			240			246			251	
Travel Time (s)		7.4			5.5			5.6			5.7	
Peak Hour Factor	0.94	0.94	0.94	0.88	0.88	0.88	0.67	0.67	0.67	0.82	0.82	0.82
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	53	915	11	45	523	23	60	15	209	6	49	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	979	0	0	591	0	0	284	0	0	67	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 86.5%		ICU Level of Service E	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	104.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	50	860	10	40	460	20	40	10	140	5	40	10
Future Vol, veh/h	50	860	10	40	460	20	40	10	140	5	40	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	88	88	88	67	67	67	82	82	82
Heavy Vehicles, %	1	1	1	2	2	2	0	0	0	0	0	0
Mvmt Flow	53	915	11	45	523	23	60	15	209	6	49	12

Major/Minor	Major1			Major2			Minor2			Minor1		
Conflicting Flow All	546	0	0	926	0	0	1682	1657	535	1659	1663	921
Stage 1	-	-	-	-	-	-	625	625	-	1027	1027	-
Stage 2	-	-	-	-	-	-	1057	1032	-	632	636	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1028	-	-	738	-	-	76	99	549	79	98	331
Stage 1	-	-	-	-	-	-	476	480	-	285	314	-
Stage 2	-	-	-	-	-	-	275	313	-	472	475	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1028	-	-	738	-	-	~ 33	81	549	36	80	331
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 33	81	-	36	80	-
Stage 1	-	-	-	-	-	-	426	438	-	255	281	-
Stage 2	-	-	-	-	-	-	196	280	-	258	433	-

Approach	EB	WB	SE	NW
HCM Control Delay, s	0.5	0.8	$ 669.6	141.5
HCM LOS			F	F

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	WBL	WBT	WBR	SELn1
Capacity (veh/h)	82	1028	-	-	738	-	-	123
HCM Lane V/C Ratio	0.818	0.052	-	-	0.062	-	-	2.306
HCM Control Delay (s)	141.5	8.7	0	-	10.2	0	-	$ 669.6
HCM Lane LOS	F	A	A	-	B	A	-	F
HCM 95th %tile Q(veh)	4.2	0.2	-	-	0.2	-	-	24.4

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	60	180	240	390	280	0	150	470	100	190	370	370
Future Volume (vph)	60	180	240	390	280	0	150	470	100	190	370	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	3539		1770	1863	1583	1787	1881	1599
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	3539		1770	1863	1583	1787	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.96	0.96	0.96	0.95	0.95	0.95
Adj. Flow (vph)	65	196	261	415	298	0	156	490	104	200	389	389
RTOR Reduction (vph)	0	0	212	0	0	0	0	0	72	0	0	129
Lane Group Flow (vph)	65	196	49	415	298	0	156	490	32	200	389	260
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6		7	4		3	8	1
Permitted Phases			2						4			8
Actuated Green, G (s)	6.7	20.7	20.7	16.4	30.4		14.2	33.8	33.8	15.1	34.7	51.1
Effective Green, g (s)	6.7	20.7	20.7	16.4	30.4		14.2	33.8	33.8	15.1	34.7	51.1
Actuated g/C Ratio	0.06	0.19	0.19	0.15	0.28		0.13	0.31	0.31	0.14	0.32	0.46
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	107	665	297	511	978		228	572	486	245	593	830
v/s Ratio Prot	0.04	0.06		c0.12	c0.08		0.09	c0.26		c0.11	0.21	0.05
v/s Ratio Perm			0.03						0.02			0.12
v/c Ratio	0.61	0.29	0.17	0.81	0.30		0.68	0.86	0.07	0.82	0.66	0.31
Uniform Delay, d1	50.4	38.4	37.4	45.3	31.4		45.8	35.8	26.9	46.1	32.5	18.5
Progression Factor	1.00	1.00	1.00	1.23	0.97		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.4	1.1	1.2	9.2	0.2		8.2	12.0	0.1	18.6	2.6	0.2
Delay (s)	59.8	39.5	38.6	65.2	30.7		54.0	47.9	27.0	64.7	35.1	18.7
Level of Service	E	D	D	E	C		D	D	C	E	D	B
Approach Delay (s)		41.6			50.8			46.2			34.6	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	42.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Volume (vph)	60	80	760	370	90	870
Future Volume (vph)	60	80	760	370	90	870
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	180	0		0	180	
Storage Lanes	1	1		1	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950					0.995
Satd. Flow (prot)	1787	1599	1881	1599	0	3556
Flt Permitted	0.950					0.995
Satd. Flow (perm)	1787	1599	1881	1599	0	3556
Link Speed (mph)	30		30			30
Link Distance (ft)	403		387			233
Travel Time (s)	9.2		8.8			5.3
Confl. Peds. (#/hr)				370		
Peak Hour Factor	0.86	0.86	0.96	0.96	0.85	0.85
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	70	93	792	385	106	1024
Shared Lane Traffic (%)						
Lane Group Flow (vph)	70	93	792	385	0	1130
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	80.0%	ICU Level of Service D	
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	57.2

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	60	80	760	370	90	870
Future Vol, veh/h	60	80	760	370	90	870
Conflicting Peds, #/hr	0	0	0	370	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	180	0	-	0	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	86	86	96	96	85	85
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	70	93	792	385	106	1024

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1886	1162	0	0	1162	0
Stage 1	1162	-	-	-	-	-
Stage 2	724	-	-	-	-	-
Critical Hdwy	6.615	6.215	-	-	4.115	-
Critical Hdwy Stg 1	5.415	-	-	-	-	-
Critical Hdwy Stg 2	5.815	-	-	-	-	-
Follow-up Hdwy	3.5095	3.3095	-	-	2.2095	-
Pot Cap-1 Maneuver	70	238	-	-	604	-
Stage 1	299	-	-	-	-	-
Stage 2	444	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 17	154	-	-	391	-
Mov Cap-2 Maneuver	~ 17	-	-	-	-	-
Stage 1	72	-	-	-	-	-
Stage 2	444	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	$ 827.6	0	5.8
HCM LOS	F		

Minor Lane/Major Mvmt	NET	NER	NWLn1	NWLn2	SWL	SWT
Capacity (veh/h)	-	-	17	154	391	-
HCM Lane V/C Ratio	-	-	4.104	0.604	0.271	-
HCM Control Delay (s)	-	-	$ 1852.6	58.8	17.6	4.6
HCM Lane LOS	-	-	F	F	C	A
HCM 95th %tile Q(veh)	-	-	9.4	3.2	1.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	130	895	5	10	620	60	15	10	15	20	10	110
Future Volume (vph)	130	895	5	10	620	60	15	10	15	20	10	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1787	3571		1787	3527			1844	1615		1821	1599
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.78	1.00
Satd. Flow (perm)	1787	3571		1787	3527			1505	1615		1476	1599
Peak-hour factor, PHF	0.97	0.97	0.97	0.95	0.95	0.95	0.90	0.90	0.90	0.80	0.80	0.80
Adj. Flow (vph)	134	923	5	11	653	63	17	11	17	25	12	138
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	16	0	0	128
Lane Group Flow (vph)	134	928	0	11	712	0	0	28	1	0	38	10
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4	4	4
Actuated Green, G (s)	13.5	82.3		1.5	70.3			8.2	8.2		8.2	8.2
Effective Green, g (s)	13.5	82.3		1.5	70.3			8.2	8.2		8.2	8.2
Actuated g/C Ratio	0.12	0.75		0.01	0.64			0.07	0.07		0.07	0.07
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	219	2671		24	2254			112	120		110	119
v/s Ratio Prot	c0.07	c0.26		0.01	0.20							
v/s Ratio Perm								0.02	0.00		c0.03	0.01
v/c Ratio	0.61	0.35		0.46	0.32			0.25	0.01		0.35	0.09
Uniform Delay, d1	45.8	4.7		53.8	9.0			48.0	47.1		48.4	47.4
Progression Factor	1.27	0.68		0.87	1.41			1.00	1.00		1.00	1.00
Incremental Delay, d2	4.5	0.3		12.3	0.3			1.2	0.0		1.9	0.3
Delay (s)	62.5	3.5		59.0	13.0			49.2	47.2		50.2	47.7
Level of Service	E	A		E	B			D	D		D	D
Approach Delay (s)		11.0			13.7			48.4			48.3	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	770	5	5	580	190	40	10	10	350	10	140
Future Volume (vph)	80	770	5	5	580	190	40	10	10	350	10	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00		1.00	0.96		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	3467	3571		1770	3408		1805	1758		1715	1724	1615
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.95	1.00
Satd. Flow (perm)	3467	3571		1770	3408		1805	1758		1715	1724	1615
Peak-hour factor, PHF	0.84	0.84	0.84	0.90	0.90	0.90	0.78	0.78	0.78	0.86	0.86	0.86
Adj. Flow (vph)	95	917	6	6	644	211	51	13	13	407	12	163
RTOR Reduction (vph)	0	0	0	0	23	0	0	12	0	0	0	113
Lane Group Flow (vph)	95	923	0	6	832	0	51	14	0	208	211	50
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases		2			6							
Actuated Green, G (s)	8.4	57.6		1.4	50.6		7.4	7.4		19.6	19.6	34.0
Effective Green, g (s)	8.4	57.6		1.4	50.6		7.4	7.4		19.6	19.6	34.0
Actuated g/C Ratio	0.08	0.52		0.01	0.46		0.07	0.07		0.18	0.18	0.31
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	264	1869		22	1567		121	118		305	307	499
v/s Ratio Prot	c0.03	c0.26		0.00	c0.24		c0.03	0.01		0.12	c0.12	0.03
v/s Ratio Perm												
v/c Ratio	0.36	0.49		0.27	0.53		0.42	0.12		0.68	0.69	0.10
Uniform Delay, d1	48.2	16.8		53.8	21.2		49.2	48.2		42.3	42.3	27.1
Progression Factor	1.00	1.00		1.19	0.89		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	0.9		6.4	0.3		2.4	0.4		6.2	6.3	0.1
Delay (s)	49.1	17.8		70.3	19.1		51.6	48.7		48.4	48.6	27.2
Level of Service	D	B		E	B		D	D		D	D	C
Approach Delay (s)		20.7			19.5			50.6			42.5	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	30	900	550	60	30	20
Future Volume (vph)	30	900	550	60	30	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	140			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.987		0.946	
Flt Protected	0.950				0.971	
Satd. Flow (prot)	1770	1863	1839	0	1694	0
Flt Permitted	0.950				0.971	
Satd. Flow (perm)	1770	1863	1839	0	1694	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		535	210		522	
Travel Time (s)		12.2	4.8		11.9	
Peak Hour Factor	0.91	0.91	0.90	0.90	0.75	0.75
Heavy Vehicles (%)	2%	2%	2%	2%	3%	3%
Adj. Flow (vph)	33	989	611	67	40	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	989	678	0	67	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 57.4%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	30	900	550	60	30	20
Future Vol, veh/h	30	900	550	60	30	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	140	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	90	90	75	75
Heavy Vehicles, %	2	2	2	2	3	3
Mvmt Flow	33	989	611	67	40	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	678	0	-	0	1700	645
Stage 1	-	-	-	-	645	-
Stage 2	-	-	-	-	1055	-
Critical Hdwy	4.12	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.218	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	914	-	-	-	101	470
Stage 1	-	-	-	-	520	-
Stage 2	-	-	-	-	333	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	914	-	-	-	97	470
Mov Cap-2 Maneuver	-	-	-	-	97	-
Stage 1	-	-	-	-	501	-
Stage 2	-	-	-	-	333	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	51
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	914	-	-	-	142
HCM Lane V/C Ratio	0.036	-	-	-	0.469
HCM Control Delay (s)	9.1	-	-	-	51
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	2.2

Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	410	280	30	40	140	120	5	10	280	150	25
Future Volume (vph)	10	410	280	30	40	140	120	5	10	280	150	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.943				0.945					0.993	
Flt Protected		0.972				0.993					0.970	
Satd. Flow (prot)	0	1724	0	0	0	1748	0	0	0	0	1812	0
Flt Permitted		0.972				0.993					0.970	
Satd. Flow (perm)	0	1724	0	0	0	1748	0	0	0	0	1812	0
Link Speed (mph)		30				30					30	
Link Distance (ft)		449				456					370	
Travel Time (s)		10.2				10.4					8.4	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.87	0.87	0.87	0.87	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%	2%	2%	1%	1%	1%	1%
Adj. Flow (vph)	11	451	308	33	46	161	138	6	11	304	163	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	803	0	0	0	351	0	0	0	0	505	0
Sign Control		Yield				Yield					Yield	

Intersection Summary			
Area Type:	Other		
Control Type: Roundabout			
Intersection Capacity Utilization 146.2%		ICU Level of Service H	
Analysis Period (min) 15			

Lane Group	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR
Lane Configurations								
Traffic Volume (vph)	65	240	350	90	10	30	120	25
Future Volume (vph)	65	240	350	90	10	30	120	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.920					0.982	
Flt Protected		0.996					0.989	
Satd. Flow (prot)	0	1724	0	0	0	0	1809	0
Flt Permitted		0.996					0.989	
Satd. Flow (perm)	0	1724	0	0	0	0	1809	0
Link Speed (mph)		30					30	
Link Distance (ft)		390					523	
Travel Time (s)		8.9					11.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%	2%	2%
Adj. Flow (vph)	72	267	389	100	11	33	132	27
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	828	0	0	0	0	203	0
Sign Control		Yield					Yield	

Intersection Summary

Intersection	
Intersection Delay, s/veh	69.6
Intersection LOS	F

Approach	WB	NB	SB	NE	SW
Entry Lanes	1	1	1	1	1
Conflicting Circle Lanes	1	1	1	1	1
Adj Approach Flow, veh/h	803	351	505	828	203
Demand Flow Rate, veh/h	811	358	510	837	208
Vehicles Circulating, veh/h	706	1065	694	539	1062
Vehicles Exiting, veh/h	717	311	576	665	455
Ped Vol Crossing Leg, #/h	0	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000	1.000
Approach Delay, s/veh	128.7	33.4	23.3	68.9	16.3
Approach LOS	F	D	C	F	C

Lane	Left	Left	Left	Left	Left
Designated Moves	LR	LTR	LTR	LTR	LTR
Assumed Moves	LR	LTR	LTR	LTR	LTR
RT Channelized					
Lane Util	1.000	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976	4.976
Entry Flow, veh/h	811	358	510	837	208
Cap Entry Lane, veh/h	672	466	680	796	467
Entry HV Adj Factor	0.990	0.980	0.991	0.990	0.977
Flow Entry, veh/h	803	351	505	828	203
Cap Entry, veh/h	665	456	674	788	456
V/C Ratio	1.208	0.769	0.750	1.051	0.445
Control Delay, s/veh	128.7	33.4	23.3	68.9	16.3
LOS	F	D	C	F	C
95th %tile Queue, veh	28	7	7	20	2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	30	330	5	30	20	310	330	10	10	130	10
Future Volume (vph)	10	30	330	5	30	20	310	330	10	10	130	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.952			0.998			0.991	
Flt Protected		0.988			0.996			0.977			0.997	
Satd. Flow (prot)	0	1840	1583	0	1802	0	0	1834	0	0	1859	0
Flt Permitted		0.988			0.996			0.977			0.997	
Satd. Flow (perm)	0	1840	1583	0	1802	0	0	1834	0	0	1859	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		168			453			475			436	
Travel Time (s)		3.8			10.3			10.8			9.9	
Peak Hour Factor	0.88	0.88	0.88	0.82	0.82	0.82	0.93	0.93	0.93	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	11	34	375	6	37	24	333	355	11	11	143	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	45	375	0	67	0	0	699	0	0	165	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 60.3%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	9.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		✣			✣			✣	
Traffic Vol, veh/h	10	30	330	5	30	20	310	330	10	10	130	10
Future Vol, veh/h	10	30	330	5	30	20	310	330	10	10	130	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	82	82	82	93	93	93	91	91	91
Heavy Vehicles, %	2	2	2	0	0	0	1	1	1	1	1	1
Mvmt Flow	11	34	375	6	37	24	333	355	11	11	143	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1228	1203	149	1402	1203	361	154	0	0	366	0	0
Stage 1	171	171	-	1027	1027	-	-	-	-	-	-	-
Stage 2	1057	1032	-	375	176	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	155	184	898	119	186	688	1433	-	-	1198	-	-
Stage 1	831	757	-	285	314	-	-	-	-	-	-	-
Stage 2	272	310	-	650	757	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	91	129	898	43	130	688	1433	-	-	1198	-	-
Mov Cap-2 Maneuver	91	129	-	43	130	-	-	-	-	-	-	-
Stage 1	588	749	-	202	222	-	-	-	-	-	-	-
Stage 2	155	219	-	358	749	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.5	49.1	3.9	0.5
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1433	-	-	117	898	146	1198	-	-
HCM Lane V/C Ratio	0.233	-	-	0.389	0.418	0.459	0.009	-	-
HCM Control Delay (s)	8.3	0	-	54.1	11.9	49.1	8	0	-
HCM Lane LOS	A	A	-	F	B	E	A	A	-
HCM 95th %tile Q(veh)	0.9	-	-	1.6	2.1	2.1	0	-	-

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	80	40	40	50	130	190	680	70	20	340	40
Future Volume (vph)	30	80	40	40	50	130	190	680	70	20	340	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1770		1787	1881	1599	1805	1873		1805	1870	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1770		1787	1881	1599	1805	1873		1805	1870	
Peak-hour factor, PHF	0.99	0.99	0.99	0.95	0.95	0.95	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	30	81	40	42	53	137	213	764	79	22	366	43
RTOR Reduction (vph)	0	22	0	0	0	85	0	4	0	0	5	0
Lane Group Flow (vph)	30	99	0	42	53	52	213	839	0	22	404	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases		6			2							
Actuated Green, G (s)	2.7	9.4		4.2	10.9	28.6	11.7	34.7		2.7	25.7	
Effective Green, g (s)	2.7	9.4		4.2	10.9	28.6	11.7	34.7		2.7	25.7	
Actuated g/C Ratio	0.04	0.13		0.06	0.15	0.38	0.16	0.46		0.04	0.34	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	63	221		100	273	609	281	866		64	640	
v/s Ratio Prot	0.02	c0.06		c0.02	0.03	0.03	c0.12	c0.45		0.01	0.22	
v/s Ratio Perm												
v/c Ratio	0.48	0.45		0.42	0.19	0.09	0.76	0.97		0.34	0.63	
Uniform Delay, d1	35.5	30.4		34.2	28.2	14.8	30.3	19.6		35.3	20.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.6	1.4		2.8	1.6	0.1	11.1	22.9		3.2	2.0	
Delay (s)	41.0	31.8		37.1	29.8	14.9	41.4	42.5		38.5	22.7	
Level of Service	D	C		D	C	B	D	D		D	C	
Approach Delay (s)		33.7			22.3			42.3			23.5	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	480	5	10	310	190	310
Future Volume (vph)	480	5	10	310	190	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998				0.916	
Flt Protected	0.953			0.999		
Satd. Flow (prot)	1789	0	0	1861	1690	0
Flt Permitted	0.953			0.999		
Satd. Flow (perm)	1789	0	0	1861	1690	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	348			709	425	
Travel Time (s)	7.9			16.1	9.7	
Peak Hour Factor	0.90	0.90	0.87	0.87	0.89	0.89
Heavy Vehicles (%)	1%	1%	2%	2%	3%	3%
Adj. Flow (vph)	533	6	11	356	213	348
Shared Lane Traffic (%)						
Lane Group Flow (vph)	539	0	0	367	561	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 62.6%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	90.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	480	5	10	310	190	310
Future Vol, veh/h	480	5	10	310	190	310
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	87	87	89	89
Heavy Vehicles, %	1	1	2	2	3	3
Mvmt Flow	533	6	11	356	213	348

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	765	387	561	0	-	0
Stage 1	387	-	-	-	-	-
Stage 2	378	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.12	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.218	-	-	-
Pot Cap-1 Maneuver	~ 373	663	1010	-	-	-
Stage 1	688	-	-	-	-	-
Stage 2	695	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 368	663	1010	-	-	-
Mov Cap-2 Maneuver	~ 368	-	-	-	-	-
Stage 1	678	-	-	-	-	-
Stage 2	695	-	-	-	-	-

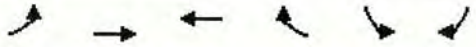
Approach	EB	NB	SB
HCM Control Delay, s	247.5	0.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1010	-	370	-	-
HCM Lane V/C Ratio	0.011	-	1.456	-	-
HCM Control Delay (s)	8.6	0	247.5	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0	-	28.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

APPENDIX S-3: 2040 ALTERNATIVE F INTERSECTION CAPACITY ANALYSES – SYNCHRO PRINTOUTS – AM PEAK HOUR

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1355	685	0	855	805
Future Volume (vph)	0	1355	685	0	855	805
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.88
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3471	3406	0	1930	2682
Flt Permitted					0.950	
Satd. Flow (perm)	0	3471	3406	0	1930	2682
Right Turn on Red				Yes		No
Satd. Flow (RTOR)						
Link Speed (mph)		30	30		25	
Link Distance (ft)		712	388		212	
Travel Time (s)		16.2	8.8		5.8	
Peak Hour Factor	0.93	0.93	0.88	0.88	0.89	0.89
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Adj. Flow (vph)	0	1457	778	0	961	904
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1457	778	0	961	904
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		24	24		16	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	0.85	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors		3	3		3	3
Detector Template		Thru	Thru		Left	
Leading Detector (ft)		256	256		256	256
Trailing Detector (ft)		-5	-5		-5	-5
Detector 1 Position(ft)		-5	-5		-5	-5
Detector 1 Size(ft)		50	50		50	50
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		125	125		125	125
Detector 2 Size(ft)		6	6		6	6
Detector 2 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0		0.0	0.0
Detector 3 Position(ft)		250	250		250	250
Detector 3 Size(ft)		6	6		6	6
Detector 3 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 3 Channel						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 3 Extend (s)		0.0	0.0		0.0	0.0
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0		5.0	5.0
Minimum Split (s)		14.0	21.0		27.0	27.0
Total Split (s)		35.0	35.0		40.0	40.0
Total Split (%)		46.7%	46.7%		53.3%	53.3%
Maximum Green (s)		29.0	29.0		34.0	34.0
Yellow Time (s)		2.0	2.0		2.0	2.0
All-Red Time (s)		4.0	4.0		4.0	4.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		14.0	14.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		29.0	29.0		34.0	34.0
Actuated g/C Ratio		0.39	0.39		0.45	0.45
v/c Ratio		1.09	0.59		1.10	0.74
Control Delay		69.3	17.5		84.4	21.6
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		69.3	17.5		84.4	21.6
LOS		E	B		F	C
Approach Delay		69.3	17.5		53.9	
Approach LOS		E	B		D	
Queue Length 50th (ft)		~485	388		~517	188
Queue Length 95th (ft)		m#586	m366		#722	261
Internal Link Dist (ft)		632	308		132	
Turn Bay Length (ft)						
Base Capacity (vph)		1342	1316		874	1215
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		1.09	0.59		1.10	0.74

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.10

Intersection Signal Delay: 52.5 Intersection LOS: D
Intersection Capacity Utilization 96.8% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: NH 102 & Exit 4 SB Off

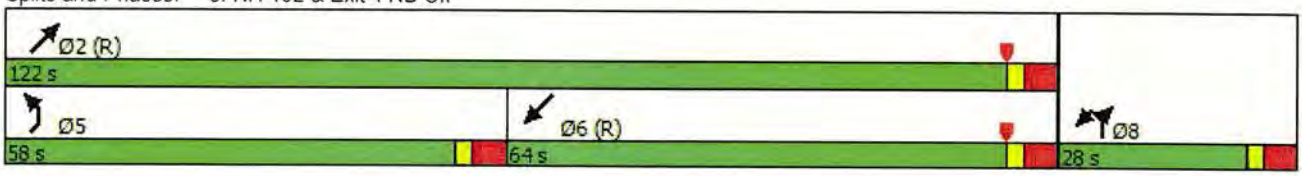
Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	455	0	365	0	0	1165	1045	0	0	1295	1155
Future Volume (vph)	455	0	365	0	0	1165	1045	0	0	1295	1155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0	0	0	550		0	0		0
Storage Lanes		2	2	0	0	2		0	0		1
Taper Length (ft)		25		25		25			25		
Lane Util. Factor	0.97	1.00	0.88	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt			0.850								0.850
Flt Protected	0.950					0.950					
Satd. Flow (prot)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Flt Permitted	0.950					0.950					
Satd. Flow (perm)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Right Turn on Red			No					Yes			Yes
Satd. Flow (RTOR)											447
Link Speed (mph)		25		30			30			30	
Link Distance (ft)		856		390			760			857	
Travel Time (s)		23.3		8.9			17.3			19.5	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Adj. Flow (vph)	517	0	415	0	0	1239	1112	0	0	1408	1255
Shared Lane Traffic (%)											
Lane Group Flow (vph)	517	0	415	0	0	1239	1112	0	0	1408	1255
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		24		0			24			24	
Link Offset(ft)		12		0			0			0	
Crosswalk Width(ft)		16		16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	25	15	9	15		9	15		25
Number of Detectors	3		3			3	3			3	0
Detector Template											
Leading Detector (ft)	256		256			256	256			256	0
Trailing Detector (ft)	-5		-5			-5	-5			-5	0
Detector 1 Position(ft)	-5		-5			-5	-5			-5	-5
Detector 1 Size(ft)	55		55			55	55			55	50
Detector 1 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Queue (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Delay (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 2 Position(ft)	125		125			125	125			125	
Detector 2 Size(ft)	6		6			6	6			6	
Detector 2 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	
Detector 2 Channel											
Detector 2 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Detector 3 Position(ft)	250		250			250	250			250	
Detector 3 Size(ft)	6		6			6	6			6	

Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	
Detector 3 Channel											
Detector 3 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Detector Phase	8		2			5	2			6	
Switch Phase											
Minimum Initial (s)	10.0		10.0			5.0	8.0			8.0	
Minimum Split (s)	16.0		16.0			11.0	42.0			31.0	
Total Split (s)	28.0		28.0			58.0	122.0			64.0	
Total Split (%)	18.7%		18.7%			38.7%	81.3%			42.7%	
Maximum Green (s)	22.0		22.0			52.0	116.0			58.0	
Yellow Time (s)	2.0		2.0			2.0	2.0			2.0	
All-Red Time (s)	4.0		4.0			4.0	4.0			4.0	
Lost Time Adjust (s)	0.0		0.0			0.0	0.0			0.0	
Total Lost Time (s)	6.0		6.0			6.0	6.0			6.0	
Lead/Lag						Lead				Lag	
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Recall Mode	None		None			None	C-Min			C-Min	
Walk Time (s)							7.0			7.0	
Flash Dont Walk (s)							29.0			17.0	
Pedestrian Calls (#/hr)							0			0	
Act Effct Green (s)	22.0		22.0			52.0	116.0			58.0	150.0
Actuated g/C Ratio	0.15		0.15			0.35	0.77			0.39	1.00
v/c Ratio	1.09		1.08			1.07	0.42			1.04	0.80
Control Delay	125.3		125.9			73.9	5.6			79.7	4.4
Queue Delay	0.0		0.0			0.0	0.0			0.0	0.0
Total Delay	125.3		125.9			73.9	5.6			79.7	4.4
LOS	F		F			E	A			E	A
Approach Delay		125.6					41.6			44.2	
Approach LOS		F					D			D	
Queue Length 50th (ft)	~291		~255			~682	152			~780	0
Queue Length 95th (ft)	#395		#365			m518	m135			#919	0
Internal Link Dist (ft)		776		310			680			777	
Turn Bay Length (ft)						550					
Base Capacity (vph)	475		386			1156	2658			1355	1568
Starvation Cap Reductn	0		0			0	0			0	0
Spillback Cap Reductn	0		0			0	0			0	0
Storage Cap Reductn	0		0			0	0			0	0
Reduced v/c Ratio	1.09		1.08			1.07	0.42			1.04	0.80

Intersection Summary	
Area Type:	Other
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 15 (10%), Referenced to phase 2:NET and 6:SWT, Start of Yellow	
Natural Cycle: 140	

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.09
Intersection Signal Delay: 55.9 Intersection LOS: E
Intersection Capacity Utilization 98.0% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: NH 102 & Exit 4 NB Off



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	795	360	390	615	0	0	0	0	495	0	500
Future Volume (vph)	0	795	360	390	615	0	0	0	0	495	0	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		350	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3167	1417	1687	3374	0	0	0	0	3303	0	1524
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	3167	1417	1687	3374	0	0	0	0	3303	0	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			357									177
Link Speed (mph)		30			30			30			35	
Link Distance (ft)		851			693			486			581	
Travel Time (s)		19.3			15.8			11.0			11.3	
Peak Hour Factor	0.92	0.92	0.92	0.73	0.73	0.73	0.92	0.92	0.92	0.74	0.74	0.74
Heavy Vehicles (%)	14%	14%	14%	7%	7%	7%	2%	2%	2%	6%	6%	6%
Adj. Flow (vph)	0	864	391	534	842	0	0	0	0	669	0	676
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	864	391	534	842	0	0	0	0	669	0	676
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Right
Median Width(ft)		36			36			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		25	15		9	15		9	15		9
Number of Detectors		3	2	3	3					3		2
Detector Template		Thru	Right	Left	Thru					Left		
Leading Detector (ft)		256	131	256	256					256		206
Trailing Detector (ft)		-5	-5	-5	-5					-5		-5
Detector 1 Position(ft)		-5	-5	-5	-5					-5		-5
Detector 1 Size(ft)		50	50	50	50					50		50
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 2 Position(ft)		125	125	125	125					125		200
Detector 2 Size(ft)		6	6	6	6					6		6
Detector 2 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 3 Position(ft)		250		250	250					250		
Detector 3 Size(ft)		6		6	6					6		

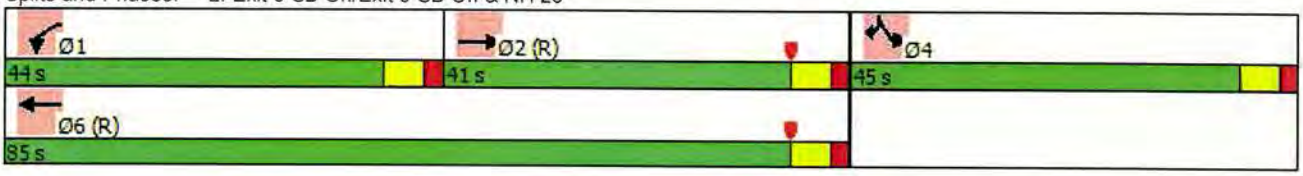
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 3 Type		Cl+Ex		Cl+Ex	Cl+Ex					Cl+Ex		
Detector 3 Channel												
Detector 3 Extend (s)		0.0		0.0	0.0					0.0		
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Detector Phase		2		1	6					4		4
Switch Phase												
Minimum Initial (s)		9.0		4.0	9.0					4.0		4.0
Minimum Split (s)		21.0		10.0	21.0					10.0		10.0
Total Split (s)		41.0		44.0	85.0					45.0		45.0
Total Split (%)		31.5%		33.8%	65.4%					34.6%		34.6%
Maximum Green (s)		35.0		38.0	79.0					39.0		39.0
Yellow Time (s)		4.0		4.0	4.0					4.0		4.0
All-Red Time (s)		2.0		2.0	2.0					2.0		2.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0					6.0		6.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Recall Mode		C-Min		None	C-Min					None		None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		8.0			8.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)		35.0	130.0	38.0	79.0					39.0		39.0
Actuated g/C Ratio		0.27	1.00	0.29	0.61					0.30		0.30
v/c Ratio		1.01	0.28	1.08	0.41					0.68		1.16
Control Delay		81.3	0.5	74.9	1.3					44.0		121.9
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		81.3	0.5	74.9	1.3					44.0		121.9
LOS		F	A	E	A					D		F
Approach Delay		56.1			29.9						83.2	
Approach LOS		E			C						F	
Queue Length 50th (ft)		~393	0	76	13					255		~566
Queue Length 95th (ft)		#534	0	m61	m11					251		#550
Internal Link Dist (ft)		771			613			406			501	
Turn Bay Length (ft)			350									
Base Capacity (vph)		852	1417	493	2050					990		581
Starvation Cap Reductn		0	0	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		1.01	0.28	1.08	0.41					0.68		1.16

Intersection Summary

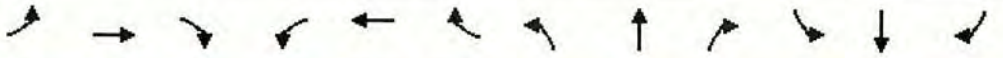
Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 67 (52%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 130

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.16
Intersection Signal Delay: 56.2 Intersection LOS: E
Intersection Capacity Utilization 85.2% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Exit 5 SB On/Exit 5 SB Off & NH 28



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	605	685	0	0	625	790	380	0	160	0	0	0
Future Volume (vph)	605	685	0	0	625	790	380	0	160	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1641	3282	0	0	3438	1538	1656	0	1482	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1641	3282	0	0	3438	1538	1656	0	1482	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						642			175			
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		693			542			867			392	
Travel Time (s)		15.8			12.3			16.9			8.9	
Peak Hour Factor	0.87	0.87	0.87	0.90	0.90	0.90	0.78	0.78	0.78	0.92	0.92	0.92
Heavy Vehicles (%)	10%	10%	10%	5%	5%	5%	9%	9%	9%	2%	2%	2%
Adj. Flow (vph)	695	787	0	0	694	878	487	0	205	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	695	787	0	0	694	878	487	0	205	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Right	Right	Left	Right	Left	Left	Right
Median Width(ft)		36			42			12			12	
Link Offset(ft)		0			0			0			36	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		25	15		9	15		9
Number of Detectors	3	3			3	2	3		0			
Detector Template	Left	Thru			Thru	Right	Left					
Leading Detector (ft)	256	256			256	131	256		0			
Trailing Detector (ft)	-5	-5			-5	-5	-5		0			
Detector 1 Position(ft)	-5	-5			-5	-5	-5		-5			
Detector 1 Size(ft)	50	50			50	50	50		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 2 Position(ft)	125	125			125	125	125					
Detector 2 Size(ft)	6	6			6	6	6					
Detector 2 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex					
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0			0.0	0.0	0.0					
Detector 3 Position(ft)	250	250			250		250					
Detector 3 Size(ft)	6	6			6		6					
Detector 3 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex					
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0			0.0		0.0					



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Detector Phase	5	2			6		8		8			
Switch Phase												
Minimum Initial (s)	4.0	16.0			16.0		4.0		4.0			
Minimum Split (s)	10.0	23.0			23.0		10.0		10.0			
Total Split (s)	57.0	89.0			32.0		41.0		41.0			
Total Split (%)	43.8%	68.5%			24.6%		31.5%		31.5%			
Maximum Green (s)	51.0	83.0			26.0		35.0		35.0			
Yellow Time (s)	4.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	2.0	2.0			2.0		2.0		2.0			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.0		6.0		6.0			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		10.0			10.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	51.0	83.0			26.0	130.0	35.0		35.0			
Actuated g/C Ratio	0.39	0.64			0.20	1.00	0.27		0.27			
v/c Ratio	1.08	0.38			1.01	0.57	1.09		0.39			
Control Delay	56.7	0.3			88.3	1.5	115.0		10.5			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	56.7	0.3			88.3	1.5	115.0		10.5			
LOS	E	A			F	A	F		B			
Approach Delay		26.8			39.8			84.0				
Approach LOS		C			D			F				
Queue Length 50th (ft)	~238	0			~315	0	~462		19			
Queue Length 95th (ft)	m#195	m0			#447	0	#536		54			
Internal Link Dist (ft)		613			462			787			312	
Turn Bay Length (ft)												
Base Capacity (vph)	643	2095			687	1538	445		526			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.08	0.38			1.01	0.57	1.09		0.39			

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 42.8	Intersection LOS: D

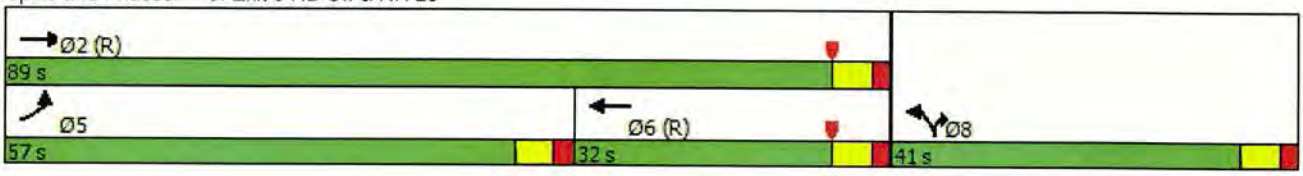
Intersection Capacity Utilization 85.2% ICU Level of Service E
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Exit 5 NB Off & NH 28



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	0	120	0	1	0	160	780	5	10	1550	40
Future Volume (vph)	10	0	120	0	1	0	160	780	5	10	1550	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		180	0		0	360		0	65		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850					0.999			0.996	
Flt Protected		0.950					0.950			0.950		
Satd. Flow (prot)	0	1770	1583	0	1900	0	1770	3536	0	1770	3525	0
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	1863	1583	0	1900	0	1770	3536	0	1770	3525	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			164					1			3	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		593			447			750			186	
Travel Time (s)		13.5			10.2			17.0			4.2	
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	11	0	130	0	4	0	174	848	5	11	1685	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	11	130	0	4	0	174	853	0	11	1728	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	3	1	3	1		3	3		3	3	
Detector Template	Left	Thru	Right	Left			Left	Thru		Left	Thru	
Leading Detector (ft)	256	256	45	256	45		256	256		256	256	
Trailing Detector (ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Position(ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	125	125		125			125	125		125	125	
Detector 2 Size(ft)	6	6		6			6	6		6	6	
Detector 2 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Detector 3 Position(ft)	250	250		250			250	250		250	250	
Detector 3 Size(ft)	6	6		6			6	6		6	6	

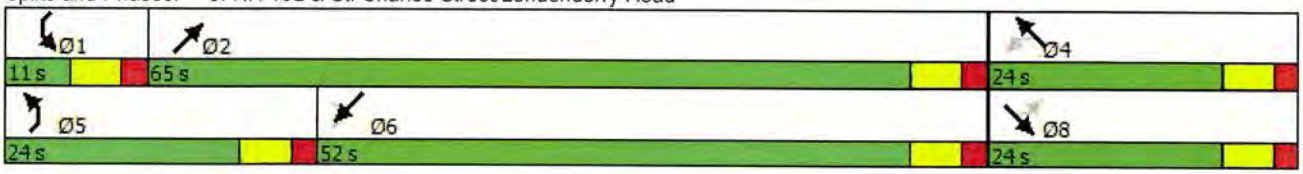
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	custom		NA		Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Detector Phase	8	8	6	4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	8.0	5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		24.0	24.0		11.0	24.0	
Total Split (s)	24.0	24.0	52.0	24.0	24.0		24.0	65.0		11.0	52.0	
Total Split (%)	24.0%	24.0%	52.0%	24.0%	24.0%		24.0%	65.0%		11.0%	52.0%	
Maximum Green (s)	18.0	18.0	46.0	18.0	18.0		18.0	59.0		5.0	46.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lead/Lag			Lag				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	Min	None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0			0	
Act Effct Green (s)		6.4	49.2		6.1		12.6	71.1		5.1	49.2	
Actuated g/C Ratio		0.08	0.64		0.08		0.17	0.93		0.07	0.64	
v/c Ratio		0.07	0.12		0.03		0.59	0.26		0.09	0.76	
Control Delay		35.2	1.3		35.0		38.1	2.1		37.9	14.5	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		35.2	1.3		35.0		38.1	2.1		37.9	14.5	
LOS		D	A		C		D	A		D	B	
Approach Delay		4.0			35.0			8.2			14.7	
Approach LOS		A			C			A			B	
Queue Length 50th (ft)		4	0		2		70	0		5	224	
Queue Length 95th (ft)		22	16		3		152	133		23	#655	
Internal Link Dist (ft)		513			367			670			106	
Turn Bay Length (ft)			180				360			65		
Base Capacity (vph)		444	1078		453		422	3293		117	2273	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.02	0.12		0.01		0.41	0.26		0.09	0.76	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 76.3
Natural Cycle: 100
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.76
Intersection Signal Delay: 11.9 Intersection LOS: B
Intersection Capacity Utilization 77.9% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: NH 102 & St. Charles Street/Londonderry Road



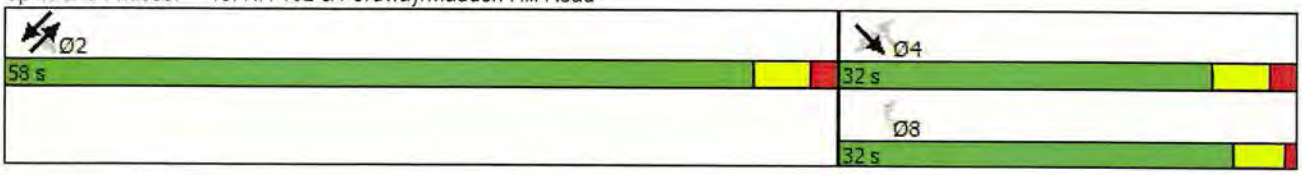
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	5	10	5	360	0	30	0	540	180	5	810	0
Future Volume (vph)	5	10	5	360	0	30	0	540	180	5	810	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		100	0		100	0		0
Storage Lanes	0		0	1		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967				0.850			0.850			
Flt Protected		0.988		0.950								
Satd. Flow (prot)	0	1780	0	1752	0	1568	0	1759	1495	0	1810	0
Flt Permitted		0.988		0.736							0.997	
Satd. Flow (perm)	0	1780	0	1358	0	1568	0	1759	1495	0	1804	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8				36			158			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		356			493			234			339	
Travel Time (s)		8.1			11.2			5.3			7.7	
Peak Hour Factor	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Adj. Flow (vph)	8	17	8	375	0	31	0	607	202	6	942	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	33	0	375	0	31	0	607	202	0	948	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		-22			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	1		3		1		2	1	3	2	
Detector Template	Left			Left		Right			Right	Left		
Leading Detector (ft)	256	45		256		45		131	45	256	131	
Trailing Detector (ft)	-5	-5		-5		-5		-5	-5	-5	-5	
Detector 1 Position(ft)	-5	-5		-5		-5		-5	-5	-5	-5	
Detector 1 Size(ft)	50	50		50		50		50	50	50	50	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	125			125				125		125	125	
Detector 2 Size(ft)	6			6				6		6	6	
Detector 2 Type	Cl+Ex			Cl+Ex				Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0				0.0		0.0	0.0	
Detector 3 Position(ft)	250			250						250		
Detector 3 Size(ft)	6			6						6		

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex			Cl+Ex						Cl+Ex		
Detector 3 Channel												
Detector 3 Extend (s)	0.0			0.0						0.0		
Turn Type	Perm	NA		D.Pm		Perm		NA	Perm	Perm	NA	
Protected Phases		4						2			2	
Permitted Phases	4			4		8			2	2		
Detector Phase	4	4		4		8		2	2	2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0		5.0		5.0	5.0	5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0		22.5		24.0	24.0	24.0	24.0	
Total Split (s)	32.0	32.0		32.0		32.0		58.0	58.0	58.0	58.0	
Total Split (%)	35.6%	35.6%		35.6%		35.6%		64.4%	64.4%	64.4%	64.4%	
Maximum Green (s)	26.0	26.0		26.0		27.5		52.0	52.0	52.0	52.0	
Yellow Time (s)	4.0	4.0		4.0		3.5		4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0		1.0		2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	0.0		0.0	
Total Lost Time (s)		6.0		6.0		4.5		6.0	6.0		6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0		3.0		3.0	3.0	3.0	3.0	
Recall Mode	None	None		None		None		Min	Min	Min	Min	
Walk Time (s)	7.0	7.0		7.0		7.0		7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0		11.0		11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0		0		0	0	0	0	
Act Effct Green (s)		25.6		25.6		27.1		50.6	50.6		50.6	
Actuated g/C Ratio		0.29		0.29		0.31		0.57	0.57		0.57	
v/c Ratio		0.06		0.95		0.06		0.60	0.22		0.92	
Control Delay		19.5		67.9		7.2		15.4	3.1		32.4	
Queue Delay		0.0		0.0		0.0		0.0	0.0		0.0	
Total Delay		19.5		67.9		7.2		15.4	3.1		32.4	
LOS		B		E		A		B	A		C	
Approach Delay		19.5			63.3			12.3			32.4	
Approach LOS		B			E			B			C	
Queue Length 50th (ft)		10		209		0		206	10		444	
Queue Length 95th (ft)		20		#385		18		303	38		#680	
Internal Link Dist (ft)		276			413			154			259	
Turn Bay Length (ft)						100			100			
Base Capacity (vph)		530		400		514		1038	947		1065	
Starvation Cap Reductn		0		0		0		0	0		0	
Spillback Cap Reductn		0		0		0		0	0		0	
Storage Cap Reductn		0		0		0		0	0		0	
Reduced v/c Ratio		0.06		0.94		0.06		0.58	0.21		0.89	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 88.2	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Maximum v/c Ratio: 0.95
Intersection Signal Delay: 30.5 Intersection LOS: C
Intersection Capacity Utilization 83.9% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: NH 102 & Fordway/Madden Hill Road



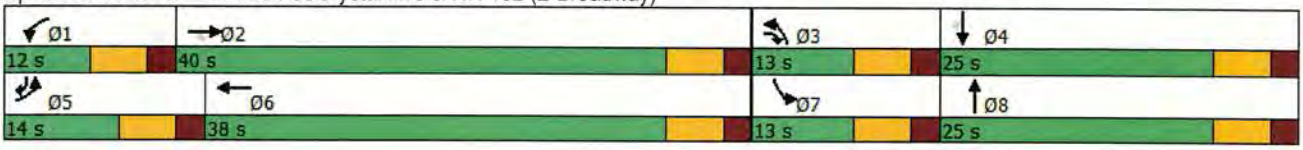
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	270	130	30	500	200	200	100	40	100	100	120
Future Volume (vph)	130	270	130	30	500	200	200	100	40	100	100	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	390		0	110		0	70		0	245		245
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.957			0.957				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1743	1333	1703	3259	0	3335	1732	0	1703	1792	1524
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1656	1743	1333	1703	3259	0	3335	1732	0	1703	1792	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			135		74			20				128
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		505			530			361			411	
Travel Time (s)		11.5			12.0			8.2			9.3	
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.91	0.91	0.91
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	5%	5%	5%	6%	6%	6%
Parking (#/hr)			0									
Adj. Flow (vph)	135	281	135	32	532	213	235	118	47	110	110	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	135	281	135	32	745	0	235	165	0	110	110	132
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Detector Phase	5	2	3	1	6		3	8		7	4	5
Switch Phase												
Minimum Initial (s)	4.0	5.0	4.0	4.0	10.0		4.0	10.0		4.0	9.0	4.0
Minimum Split (s)	10.0	30.0	10.0	10.0	30.0		10.0	25.0		10.0	25.0	10.0
Total Split (s)	14.0	40.0	13.0	12.0	38.0		13.0	25.0		13.0	25.0	14.0
Total Split (%)	15.6%	44.4%	14.4%	13.3%	42.2%		14.4%	27.8%		14.4%	27.8%	15.6%
Maximum Green (s)	8.0	34.0	7.0	6.0	32.0		7.0	19.0		7.0	19.0	8.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	Min	Min	None	Min		Min	None		Min	None	None
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		10			10			0			10	
Act Effct Green (s)	8.1	32.3	50.6	6.0	22.4		10.8	12.5		7.1	12.3	23.0
Actuated g/C Ratio	0.11	0.43	0.68	0.08	0.30		0.15	0.17		0.10	0.17	0.31
v/c Ratio	0.75	0.37	0.14	0.24	0.72		0.49	0.54		0.68	0.37	0.24
Control Delay	62.3	18.0	2.5	40.3	25.2		38.9	32.8		58.7	32.7	5.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	62.3	18.0	2.5	40.3	25.2		38.9	32.8		58.7	32.7	5.3
LOS	E	B	A	D	C		D	C		E	C	A
Approach Delay		25.0			25.8			36.4			30.6	
Approach LOS		C			C			D			C	
Queue Length 50th (ft)	60	71	0	14	139		53	60		49	45	1
Queue Length 95th (ft)	#185	183	26	46	220		#124	123		#155	101	38
Internal Link Dist (ft)		425			450			281			331	
Turn Bay Length (ft)	390			110			70			245		245
Base Capacity (vph)	180	815	949	139	1461		484	463		162	463	559
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.75	0.34	0.14	0.23	0.51		0.49	0.36		0.68	0.24	0.24

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 74.4
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 28.5 Intersection LOS: C
Intersection Capacity Utilization 61.3% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Birch St/Crystal Ave & NH 102 (E Broadway)



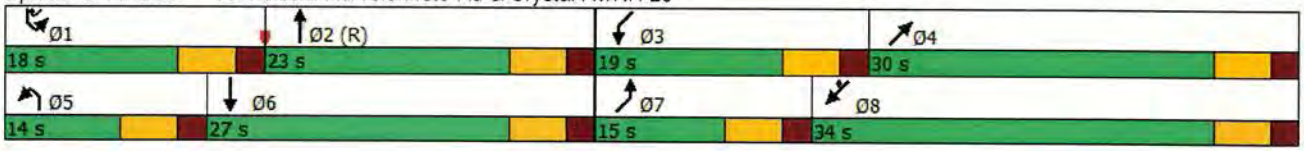
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	120	180	240	100	0	90	260	20	145	430	345
Future Volume (vph)	20	120	180	240	100	0	90	260	20	145	430	345
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		90	360		0	190		180	0		210
Storage Lanes	1		1	2		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	3471	1553	3335	3438	0	1752	1845	1568	1752	1845	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	3471	1553	3335	3438	0	1752	1845	1568	1752	1845	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			214						255			348
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		639			476			532			387	
Travel Time (s)		14.5			10.8			12.1			8.8	
Peak Hour Factor	0.84	0.84	0.84	0.79	0.79	0.79	0.86	0.86	0.86	0.99	0.99	0.99
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	24	143	214	304	127	0	105	302	23	146	434	348
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	143	214	304	127	0	105	302	23	146	434	348
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Free	Prot	NA	pt+ov
Protected Phases	5	2		1	6		7	4		3	8	8 1
Permitted Phases		2	2		6			4	Free		8	
Detector Phase	5	2	2	1	6		7	4		3	8	8 1
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		6.0	8.0		7.0	8.0	
Minimum Split (s)	14.0	21.0	21.0	14.0	21.0		12.0	21.0		13.0	21.0	
Total Split (s)	14.0	23.0	23.0	18.0	27.0		15.0	30.0		19.0	34.0	
Total Split (%)	15.6%	25.6%	25.6%	20.0%	30.0%		16.7%	33.3%		21.1%	37.8%	
Maximum Green (s)	8.0	17.0	17.0	12.0	21.0		9.0	24.0		13.0	28.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	C-Max	C-Max	None	Max		None	None		None	None	
Walk Time (s)		5.0	5.0		5.0			5.0			5.0	
Flash Dont Walk (s)		10.0	10.0		10.0			10.0			10.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effct Green (s)	11.9	21.3	21.3	11.5	21.0		8.5	21.7	90.0	11.4	27.1	44.7
Actuated g/C Ratio	0.13	0.24	0.24	0.13	0.23		0.09	0.24	1.00	0.13	0.30	0.50
v/c Ratio	0.11	0.17	0.40	0.71	0.16		0.63	0.68	0.01	0.66	0.78	0.37
Control Delay	39.1	30.4	7.3	48.8	24.1		56.9	38.8	0.0	51.5	39.9	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	39.1	30.4	7.3	48.8	24.1		56.9	38.8	0.0	51.5	39.9	2.6
LOS	D	C	A	D	C		E	D	A	D	D	A
Approach Delay		18.0			41.5			41.2			27.7	
Approach LOS		B			D			D			C	
Queue Length 50th (ft)	13	36	0	97	23		58	150	0	79	221	0
Queue Length 95th (ft)	35	58	46	91	48		#113	223	0	140	#345	41
Internal Link Dist (ft)		559			396			452			307	
Turn Bay Length (ft)	110		90	360			190		180			210
Base Capacity (vph)	228	822	531	444	802		175	493	1568	253	574	939
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.17	0.40	0.68	0.16		0.60	0.61	0.01	0.58	0.76	0.37

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 31.4 Intersection LOS: C
Intersection Capacity Utilization 56.1% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Folsom Rd/Tsienneto Rd & Crystal Av/NH 28



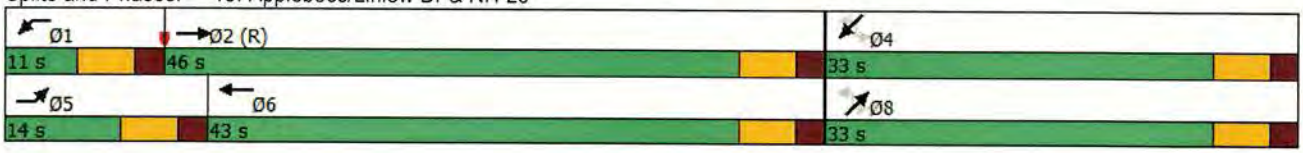
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	40	580	0	0	470	20	5	0	5	20	0	130
Future Volume (vph)	40	580	0	0	470	20	5	0	5	20	0	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	115		150	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.994				0.850			0.850
Flt Protected	0.950							0.950			0.950	
Satd. Flow (prot)	1687	3374	0	1863	3518	0	0	1805	1615	0	1787	1599
Flt Permitted	0.950							0.743			0.751	
Satd. Flow (perm)	1687	3374	0	1863	3518	0	0	1412	1615	0	1413	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					6				109			144
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		277			671			218			433	
Travel Time (s)		6.3			15.3			5.0			9.8	
Peak Hour Factor	0.83	0.83	0.83	0.92	0.92	0.92	0.50	0.50	0.50	0.90	0.90	0.90
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	48	699	0	0	511	22	10	0	10	22	0	144
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	699	0	0	533	0	0	10	10	0	22	144
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases					6		8	8	8	4		4
Detector Phase	5	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.0	46.0		11.0	43.0		33.0	33.0	33.0	33.0	33.0	33.0
Total Split (s)	14.0	46.0		11.0	43.0		33.0	33.0	33.0	33.0	33.0	33.0
Total Split (%)	15.6%	51.1%		12.2%	47.8%		36.7%	36.7%	36.7%	36.7%	36.7%	36.7%
Maximum Green (s)	8.0	40.0		5.0	37.0		27.0	27.0	27.0	27.0	27.0	27.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	None		None	None	None	None	None	None
Act Effct Green (s)	8.8	70.5			61.4			7.5	7.5		7.5	7.5
Actuated g/C Ratio	0.10	0.78			0.68			0.08	0.08		0.08	0.08
v/c Ratio	0.29	0.26			0.22			0.09	0.04		0.19	0.55
Control Delay	37.7	5.0			8.8			38.0	0.4		41.0	15.0
Queue Delay	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Delay	37.7	5.0			8.8			38.0	0.4		41.0	15.0
LOS	D	A			A			D	A		D	B
Approach Delay		7.1			8.8			19.2			18.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		A			A			B			B	
Queue Length 50th (ft)	27	28			78			5	0		12	0
Queue Length 95th (ft)	56	182			144			11	0		34	53
Internal Link Dist (ft)		197			591			138			353	
Turn Bay Length (ft)	110											
Base Capacity (vph)	164	2644			2400			423	560		423	580
Starvation Cap Reductn	0	0			0			0	0		0	0
Spillback Cap Reductn	0	0			0			0	0		0	0
Storage Cap Reductn	0	0			0			0	0		0	0
Reduced v/c Ratio	0.29	0.26			0.22			0.02	0.02		0.05	0.25

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 63 (70%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 9.2 Intersection LOS: A
Intersection Capacity Utilization 43.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 13: Applebees/Linlew Dr & NH 28

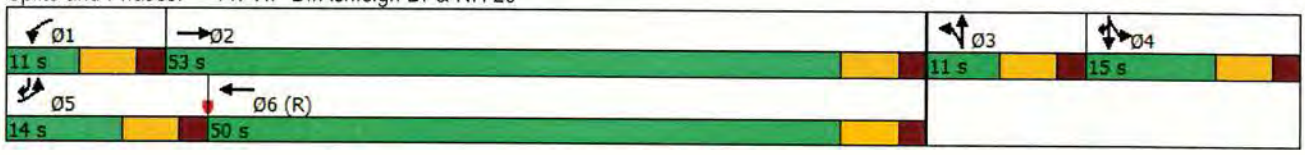


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	470	5	5	450	160	10	5	5	180	5	100
Future Volume (vph)	70	470	5	5	450	160	10	5	5	180	5	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	280		150	205		150	0		0	325		150
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (ft)	200			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.998			0.961			0.925				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.955	
Satd. Flow (prot)	3303	3399	0	1736	3336	0	1805	1758	0	1665	1674	1568
Flt Permitted	0.950			0.950			0.950			0.950	0.955	
Satd. Flow (perm)	3303	3399	0	1736	3336	0	1805	1758	0	1665	1674	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			78			7				111
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		412			486			151			446	
Travel Time (s)		9.4			11.0			3.4			10.1	
Peak Hour Factor	0.83	0.83	0.83	0.97	0.97	0.97	0.67	0.67	0.67	0.90	0.90	0.90
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Adj. Flow (vph)	84	566	6	5	464	165	15	7	7	200	6	111
Shared Lane Traffic (%)										49%		
Lane Group Flow (vph)	84	572	0	5	629	0	15	14	0	102	104	111
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases								3				
Detector Phase	5	2		1	6		3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	5.0		8.0	8.0	
Minimum Split (s)	14.0	53.0		11.0	50.0		11.0	11.0		15.0	15.0	
Total Split (s)	14.0	53.0		11.0	50.0		11.0	11.0		15.0	15.0	
Total Split (%)	15.6%	58.9%		12.2%	55.6%		12.2%	12.2%		16.7%	16.7%	
Maximum Green (s)	8.0	47.0		5.0	44.0		5.0	5.0		9.0	9.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	C-Min		None	None		None	None	
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	7.7	56.3		5.9	45.1		6.3	6.3		11.5	11.5	25.1
Actuated g/C Ratio	0.09	0.63		0.07	0.50		0.07	0.07		0.13	0.13	0.28
v/c Ratio	0.30	0.27		0.04	0.37		0.12	0.11		0.48	0.49	0.21
Control Delay	40.9	10.6		62.6	8.7		40.8	30.0		43.5	43.7	5.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	40.9	10.6		62.6	8.7		40.8	30.0		43.5	43.7	5.4
LOS	D	B		E	A		D	C		D	D	A
Approach Delay		14.5			9.1			35.6			30.2	
Approach LOS		B			A			D			C	
Queue Length 50th (ft)	23	73		3	34		8	4		57	58	0
Queue Length 95th (ft)	41	149		m13	210		20	16		104	106	34
Internal Link Dist (ft)		332			406			71			366	
Turn Bay Length (ft)	280			205						325		150
Base Capacity (vph)	308	2210		113	1858		127	130		215	216	513
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.27	0.26		0.04	0.34		0.12	0.11		0.47	0.48	0.22

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 6:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 15.8		Intersection LOS: B	
Intersection Capacity Utilization 48.5%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 14: VIP Dr/Ashleigh Dr & NH 28



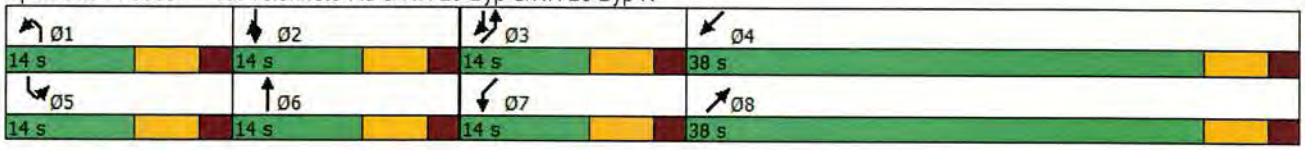
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	50	20	20	50	160	80	240	80	80	520	50
Future Volume (vph)	30	50	20	20	50	160	80	240	80	80	520	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		150	190		190	135		0	120		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.958				0.850		0.962			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1767	0	1736	1827	1553	1770	1792	0	1787	1857	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1767	0	1736	1827	1553	1770	1792	0	1787	1857	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20				198		25			7	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		481			347			479			371	
Travel Time (s)		10.9			7.9			10.9			8.4	
Peak Hour Factor	0.82	0.82	0.82	0.81	0.81	0.81	0.68	0.68	0.68	0.78	0.78	0.78
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	37	61	24	25	62	198	118	353	118	103	667	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	85	0	25	62	198	118	471	0	103	731	0
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases												
Detector Phase	1	6		5	2	2 3	3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	14.0		14.0	14.0		14.0	14.0		14.0	14.0	
Total Split (s)	14.0	14.0		14.0	14.0		14.0	38.0		14.0	38.0	
Total Split (%)	17.5%	17.5%		17.5%	17.5%		17.5%	47.5%		17.5%	47.5%	
Maximum Green (s)	8.0	8.0		8.0	8.0		8.0	32.0		8.0	32.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	Max		None	None		None	None	
Act Effct Green (s)	8.1	10.7		8.1	8.1	22.2	8.1	35.0		8.1	31.8	
Actuated g/C Ratio	0.11	0.14		0.11	0.11	0.30	0.11	0.47		0.11	0.43	
v/c Ratio	0.19	0.31		0.13	0.31	0.33	0.61	0.55		0.53	0.91	
Control Delay	35.4	28.5		34.5	37.5	5.4	49.0	18.9		44.5	39.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	35.4	28.5		34.5	37.5	5.4	49.0	18.9		44.5	39.6	
LOS	D	C		C	D	A	D	B		D	D	
Approach Delay		30.6			15.0			25.0			40.2	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		C			B			C			D	
Queue Length 50th (ft)	17	24		12	29	0	58	175		50	348	
Queue Length 95th (ft)	41	66		31	60	34	82	181		85	#453	
Internal Link Dist (ft)		401			267			399			291	
Turn Bay Length (ft)	200			190		190	135			120		
Base Capacity (vph)	191	272		189	199	605	193	862		195	816	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.19	0.31		0.13	0.31	0.33	0.61	0.55		0.53	0.90	

Intersection Summary

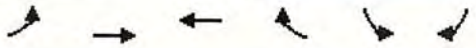
Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 73.9
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 30.7 — Intersection LOS: C
Intersection Capacity Utilization 62.0% — ICU Level of Service B
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: Tsienneto Rd & NH 28 Byp S/NH 28 Byp N



APPENDIX S-4: 2040 ALTERNATIVE F INTERSECTION CAPACITY ANALYSES – SYNCHRO PRINTOUTS – PM PEAK HOUR

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱↱
Traffic Volume (vph)	0	1310	1330	0	1005	1135
Future Volume (vph)	0	1310	1330	0	1005	1135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.88
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3471	3406	0	1930	2682
Flt Permitted					0.950	
Satd. Flow (perm)	0	3471	3406	0	1930	2682
Right Turn on Red				Yes		No
Satd. Flow (RTOR)						
Link Speed (mph)		30	30		25	
Link Distance (ft)		712	388		212	
Travel Time (s)		16.2	8.8		5.8	
Peak Hour Factor	0.93	0.93	0.88	0.88	0.89	0.89
Heavy Vehicles (%)	4%	4%	6%	6%	6%	6%
Adj. Flow (vph)	0	1409	1511	0	1129	1275
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1409	1511	0	1129	1275
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		24	24		16	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	0.85	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors		3	3		3	3
Detector Template		Thru	Thru		Left	
Leading Detector (ft)		256	256		256	256
Trailing Detector (ft)		-5	-5		-5	-5
Detector 1 Position(ft)		-5	-5		-5	-5
Detector 1 Size(ft)		50	50		50	50
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		125	125		125	125
Detector 2 Size(ft)		6	6		6	6
Detector 2 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0		0.0	0.0
Detector 3 Position(ft)		250	250		250	250
Detector 3 Size(ft)		6	6		6	6
Detector 3 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 3 Channel						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 3 Extend (s)		0.0	0.0		0.0	0.0
Turn Type		NA	NA		Prot	Prot
Protected Phases		2	6		4	4
Permitted Phases						
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		8.0	8.0		5.0	5.0
Minimum Split (s)		14.0	21.0		27.0	27.0
Total Split (s)		54.0	54.0		66.0	66.0
Total Split (%)		45.0%	45.0%		55.0%	55.0%
Maximum Green (s)		48.0	48.0		60.0	60.0
Yellow Time (s)		2.0	2.0		2.0	2.0
All-Red Time (s)		4.0	4.0		4.0	4.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		14.0	14.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		48.0	48.0		60.0	60.0
Actuated g/C Ratio		0.40	0.40		0.50	0.50
v/c Ratio		1.02	1.11		1.17	0.95
Control Delay		44.5	58.9		117.1	44.5
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		44.5	58.9		117.1	44.5
LOS		D	E		F	D
Approach Delay		44.5	58.9		78.6	
Approach LOS		D	E		E	
Queue Length 50th (ft)		~553	~704		~1042	518
Queue Length 95th (ft)		m#702	m50		#1276	#687
Internal Link Dist (ft)		632	308		132	
Turn Bay Length (ft)						
Base Capacity (vph)		1388	1362		965	1341
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		1.02	1.11		1.17	0.95

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.17

Intersection Signal Delay: 64.0
Intersection Capacity Utilization 104.4%
Analysis Period (min) 15

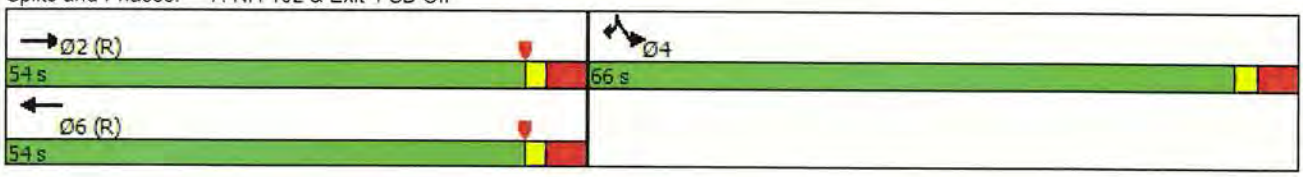
Intersection LOS: E
ICU Level of Service G

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: NH 102 & Exit 4 SB Off



Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	1250	0	1105	0	0	985	1330	0	0	570	795
Future Volume (vph)	1250	0	1105	0	0	985	1330	0	0	570	795
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0	0	0	550		0	0		0
Storage Lanes		2	2	0	0	2		0	0		1
Taper Length (ft)		25		25		25			25		
Lane Util. Factor	0.97	1.00	0.88	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt			0.850								0.850
Flt Protected	0.950					0.950					
Satd. Flow (prot)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Flt Permitted	0.950					0.950					
Satd. Flow (perm)	3242	0	2632	0	0	3335	3438	0	0	3505	1568
Right Turn on Red			No					Yes			Yes
Satd. Flow (RTOR)											750
Link Speed (mph)		25		30			30			30	
Link Distance (ft)		856		390			760			857	
Travel Time (s)		23.3		8.9			17.3			19.5	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	8%	8%	8%	2%	2%	5%	5%	5%	3%	3%	3%
Adj. Flow (vph)	1420	0	1256	0	0	1048	1415	0	0	620	864
Shared Lane Traffic (%)											
Lane Group Flow (vph)	1420	0	1256	0	0	1048	1415	0	0	620	864
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		24		0			24			24	
Link Offset(ft)		12		0			0			0	
Crosswalk Width(ft)		16		16			16			16	
Two way Left Turn Lane											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	25	15	9	15		9	15		25
Number of Detectors	3		3			3	3			3	0
Detector Template											
Leading Detector (ft)	256		256			256	256			256	0
Trailing Detector (ft)	-5		-5			-5	-5			-5	0
Detector 1 Position(ft)	-5		-5			-5	-5			-5	-5
Detector 1 Size(ft)	55		55			55	55			55	50
Detector 1 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel											
Detector 1 Extend (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Queue (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 1 Delay (s)	0.0		0.0			0.0	0.0			0.0	0.0
Detector 2 Position(ft)	125		125			125	125			125	
Detector 2 Size(ft)	6		6			6	6			6	
Detector 2 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	
Detector 2 Channel											
Detector 2 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Detector 3 Position(ft)	250		250			250	250			250	
Detector 3 Size(ft)	6		6			6	6			6	

Lane Group	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	
Detector 3 Channel											
Detector 3 Extend (s)	0.0		0.0			0.0	0.0			0.0	
Turn Type	Prot		Prot			Prot	NA			NA	Free
Protected Phases	8		8			5	2			6	
Permitted Phases											Free
Detector Phase	8		2			5	2			6	
Switch Phase											
Minimum Initial (s)	10.0		10.0			5.0	8.0			8.0	
Minimum Split (s)	16.0		16.0			11.0	42.0			31.0	
Total Split (s)	50.0		50.0			38.0	70.0			32.0	
Total Split (%)	41.7%		41.7%			31.7%	58.3%			26.7%	
Maximum Green (s)	44.0		44.0			32.0	64.0			26.0	
Yellow Time (s)	2.0		2.0			2.0	2.0			2.0	
All-Red Time (s)	4.0		4.0			4.0	4.0			4.0	
Lost Time Adjust (s)	0.0		0.0			0.0	0.0			0.0	
Total Lost Time (s)	6.0		6.0			6.0	6.0			6.0	
Lead/Lag						Lead				Lag	
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0			3.0	3.0			3.0	
Recall Mode	None		None			None	C-Min			C-Min	
Walk Time (s)							7.0			7.0	
Flash Dont Walk (s)							29.0			17.0	
Pedestrian Calls (#/hr)							0			0	
Act Effct Green (s)	44.0		44.0			32.0	64.0			26.0	120.0
Actuated g/C Ratio	0.37		0.37			0.27	0.53			0.22	1.00
v/c Ratio	1.20		1.30			1.18	0.77			0.82	0.55
Control Delay	131.1		176.4			117.1	20.9			54.6	1.4
Queue Delay	0.0		0.0			0.0	0.0			0.0	0.0
Total Delay	131.1		176.4			117.1	20.9			54.6	1.4
LOS	F		F			F	C			D	A
Approach Delay		152.4					61.8			23.6	
Approach LOS		F					E			C	
Queue Length 50th (ft)	~686		~708			~497	447			242	0
Queue Length 95th (ft)	#793		#827			m#434	m379			#312	0
Internal Link Dist (ft)		776		310			680			777	
Turn Bay Length (ft)						550					
Base Capacity (vph)	1188		965			889	1833			759	1568
Starvation Cap Reductn	0		0			0	0			0	0
Spillback Cap Reductn	0		0			0	0			0	0
Storage Cap Reductn	0		0			0	0			0	0
Reduced v/c Ratio	1.20		1.30			1.18	0.77			0.82	0.55

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 44 (37%), Referenced to phase 2:NET and 6:SWT, Start of Yellow	
Natural Cycle: 150	

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.30
Intersection Signal Delay: 89.9 Intersection LOS: F
Intersection Capacity Utilization 95.5% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: NH 102 & Exit 4 NB Off

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑↑					↰↰		↱
Traffic Volume (vph)	0	925	385	240	525	0	0	0	0	740	0	480
Future Volume (vph)	0	925	385	240	525	0	0	0	0	740	0	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		350	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3471	1553	1719	3438	0	0	0	0	3367	0	1553
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	3471	1553	1719	3438	0	0	0	0	3367	0	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			428									298
Link Speed (mph)		30			30			30			35	
Link Distance (ft)		851			693			486			581	
Travel Time (s)		19.3			15.8			11.0			11.3	
Peak Hour Factor	0.87	0.87	0.87	0.86	0.86	0.86	0.92	0.92	0.92	0.91	0.91	0.91
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	0	1063	443	279	610	0	0	0	0	813	0	527
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1063	443	279	610	0	0	0	0	813	0	527
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Right	Left	Right
Median Width(ft)		36			36			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		25	15		9	15		9	15		25
Number of Detectors		3	3	3	3					3		3
Detector Template		Thru	Right	Left	Thru					Left		Right
Leading Detector (ft)		256	256	256	256					256		256
Trailing Detector (ft)		-5	-5	-5	-5					-5		-5
Detector 1 Position(ft)		-5	-5	-5	-5					-5		-5
Detector 1 Size(ft)		50	50	50	50					50		50
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 2 Position(ft)		125	125	125	125					125		125
Detector 2 Size(ft)		6	6	6	6					6		6
Detector 2 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 3 Position(ft)		250	250	250	250					250		250
Detector 3 Size(ft)		6	6	6	6					6		6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 3 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 3 Channel												
Detector 3 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Free	Prot	NA					Prot		Prot
Protected Phases		2		1	6					4		4
Permitted Phases			Free									
Detector Phase		2		1	6					4		4
Switch Phase												
Minimum Initial (s)		9.0		4.0	9.0					4.0		4.0
Minimum Split (s)		21.0		10.0	21.0					10.0		10.0
Total Split (s)		42.0		25.0	67.0					33.0		33.0
Total Split (%)		42.0%		25.0%	67.0%					33.0%		33.0%
Maximum Green (s)		36.0		19.0	61.0					27.0		27.0
Yellow Time (s)		4.0		4.0	4.0					4.0		4.0
All-Red Time (s)		2.0		2.0	2.0					2.0		2.0
Lost Time Adjust (s)		0.0		0.0	0.0					0.0		0.0
Total Lost Time (s)		6.0		6.0	6.0					6.0		6.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		5.0		3.0	5.0					3.0		3.0
Recall Mode		C-Min		None	C-Min					None		None
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		8.0			8.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)		36.6	100.0	18.4	61.0					27.0		27.0
Actuated g/C Ratio		0.37	1.00	0.18	0.61					0.27		0.27
v/c Ratio		0.84	0.29	0.89	0.29					0.89		0.83
Control Delay		36.3	0.5	30.6	0.2					49.0		27.3
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		36.3	0.5	30.6	0.2					49.0		27.3
LOS		D	A	C	A					D		C
Approach Delay		25.8			9.7						40.4	
Approach LOS		C			A						D	
Queue Length 50th (ft)		325	0	11	0					257		143
Queue Length 95th (ft)		391	0	m#57	m0					#364		#331
Internal Link Dist (ft)		771			613			406			501	
Turn Bay Length (ft)			350									
Base Capacity (vph)		1271	1553	326	2097					909		636
Starvation Cap Reductn		0	0	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.84	0.29	0.86	0.29					0.89		0.83

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 55 (55%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 90

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 27.2 Intersection LOS: C
Intersection Capacity Utilization 76.8% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Exit 5 SB On/Exit 5 SB Off & NH 28

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	580	1085	0	0	470	560	295	0	360	0	0	0
Future Volume (vph)	580	1085	0	0	470	560	295	0	360	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1752	3505	0	0	3505	1568	1703	0	1524	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1752	3505	0	0	3505	1568	1703	0	1524	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						615			98			
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		693			542			867			392	
Travel Time (s)		15.8			12.3			16.9			8.9	
Peak Hour Factor	0.92	0.92	0.92	0.91	0.91	0.91	0.67	0.67	0.67	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	6%	6%	6%	2%	2%	2%
Adj. Flow (vph)	630	1179	0	0	516	615	440	0	537	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	630	1179	0	0	516	615	440	0	537	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Right	Left	Right	Left	Left	Right
Median Width(ft)		36			42			12			12	
Link Offset(ft)		0			0			0			36	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		25	15		25	15		9
Number of Detectors	3	3			3	3	3		0			
Detector Template	Left					Right	Left					
Leading Detector (ft)	256	256			256	256	256		0			
Trailing Detector (ft)	-5	-5			-5	-5	-5		0			
Detector 1 Position(ft)	-5	-5			-5	-5	-5		-5			
Detector 1 Size(ft)	50	50			50	50	50		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 2 Position(ft)	125	125			125	125	125					
Detector 2 Size(ft)	6	6			6	6	6					
Detector 2 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex					
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0			0.0	0.0	0.0					
Detector 3 Position(ft)	250	250			250	250	250					
Detector 3 Size(ft)	6	6			6	6	6					
Detector 3 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex					
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0			0.0	0.0	0.0					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA			NA	Free	Prot		Prot			
Protected Phases	5	2			6		8		8			
Permitted Phases		2			6	Free						
Detector Phase	5	2			6		8		8			
Switch Phase												
Minimum Initial (s)	4.0	16.0			16.0		4.0		4.0			
Minimum Split (s)	10.0	23.0			23.0		11.0		11.0			
Total Split (s)	41.0	66.0			25.0		34.0		34.0			
Total Split (%)	41.0%	66.0%			25.0%		34.0%		34.0%			
Maximum Green (s)	35.0	60.0			19.0		28.0		28.0			
Yellow Time (s)	4.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	2.0	2.0			2.0		2.0		2.0			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.0		6.0		6.0			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		10.0			10.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	35.0	60.0			19.0	100.0	28.0		28.0			
Actuated g/C Ratio	0.35	0.60			0.19	1.00	0.28		0.28			
v/c Ratio	1.03	0.56			0.78	0.39	0.92		1.08			
Control Delay	45.0	3.2			47.7	0.7	62.2		93.1			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	45.0	3.2			47.7	0.7	62.2		93.1			
LOS	D	A			D	A	E		F			
Approach Delay		17.8			22.2			79.2				
Approach LOS		B			C			E				
Queue Length 50th (ft)	~446	11			165	0	272		~337			
Queue Length 95th (ft)	m#611	m64			#225	0	266		#304			
Internal Link Dist (ft)		613			462			787			312	
Turn Bay Length (ft)												
Base Capacity (vph)	613	2103			665	1568	477		498			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.03	0.56			0.78	0.39	0.92		1.08			

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.08
Intersection Signal Delay: 34.4 Intersection LOS: C

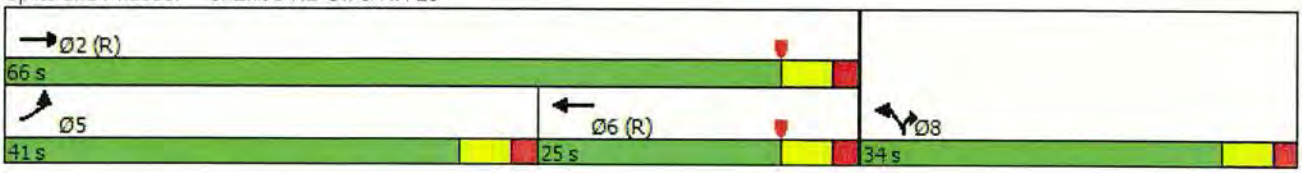
Intersection Capacity Utilization 76.8% ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Exit 5 NB Off & NH 28



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	5	160	10	0	10	650	1440	120	10	1020	50
Future Volume (vph)	10	5	160	10	0	10	650	1440	120	10	1020	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		180	0		0	360		0	65		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.932			0.988			0.993	
Flt Protected		0.967			0.976		0.950			0.950		
Satd. Flow (prot)	0	1801	1583	0	1728	0	1770	3497	0	1770	3514	0
Flt Permitted		0.740			0.834		0.950			0.950		
Satd. Flow (perm)	0	1378	1583	0	1477	0	1770	3497	0	1770	3514	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			174		126			15			4	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		593			447			750			186	
Travel Time (s)		13.5			10.2			17.0			4.2	
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	11	5	174	40	0	40	707	1565	130	11	1109	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	174	0	80	0	707	1695	0	11	1163	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	3	1	3	1		3	3		3	3	
Detector Template	Left	Thru	Right	Left			Left	Thru		Left	Thru	
Leading Detector (ft)	256	256	45	256	45		256	256		256	256	
Trailing Detector (ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Position(ft)	-5	-5	-5	-5	-5		-5	-5		-5	-5	
Detector 1 Size(ft)	50	50	50	50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	125	125		125			125	125		125	125	
Detector 2 Size(ft)	6	6		6			6	6		6	6	
Detector 2 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Detector 3 Position(ft)	250	250		250			250	250		250	250	
Detector 3 Size(ft)	6	6		6			6	6		6	6	

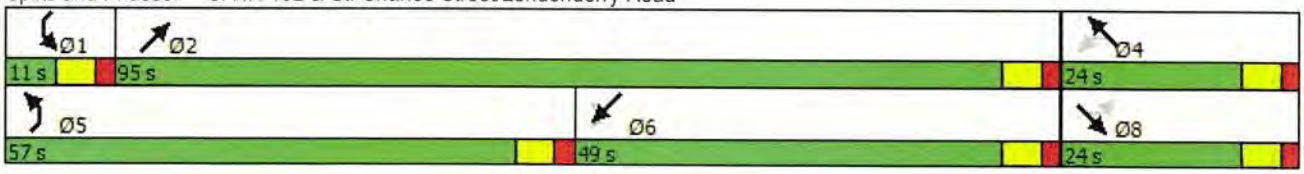
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 3 Channel												
Detector 3 Extend (s)	0.0	0.0		0.0			0.0	0.0		0.0	0.0	
Turn Type	Perm	NA	custom	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8		6	4								
Detector Phase	8	8	6	4	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	8.0	5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		24.0	24.0		11.0	24.0	
Total Split (s)	24.0	24.0	49.0	24.0	24.0		57.0	95.0		11.0	49.0	
Total Split (%)	18.5%	18.5%	37.7%	18.5%	18.5%		43.8%	73.1%		8.5%	37.7%	
Maximum Green (s)	18.0	18.0	43.0	18.0	18.0		51.0	89.0		5.0	43.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lead/Lag			Lag				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	Min	None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0			0	
Act Effct Green (s)		6.9	43.1		6.9		51.1	99.4		5.0	43.1	
Actuated g/C Ratio		0.06	0.37		0.06		0.44	0.85		0.04	0.37	
v/c Ratio		0.20	0.25		0.39		0.91	0.57		0.14	0.89	
Control Delay		58.9	4.8		7.7		49.3	4.8		60.0	45.3	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		58.9	4.8		7.7		49.3	4.8		60.0	45.3	
LOS		E	A		A		D	A		E	D	
Approach Delay		9.4			7.7			17.9			45.4	
Approach LOS		A			A			B			D	
Queue Length 50th (ft)		12	0		0		505	152		8	441	
Queue Length 95th (ft)		36	47		0		#776	373		29	#594	
Internal Link Dist (ft)		513			367			670			106	
Turn Bay Length (ft)			180				360			65		
Base Capacity (vph)		213	694		335		775	2983		76	1300	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.08	0.25		0.24		0.91	0.57		0.14	0.89	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 116.6
Natural Cycle: 130
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.91
Intersection Signal Delay: 25.7 Intersection LOS: C
Intersection Capacity Utilization 92.4% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: NH 102 & St. Charles Street/Londonderry Road



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	30	5	260	0	50	0	1020	220	15	555	0
Future Volume (vph)	10	30	5	260	0	50	0	1020	220	15	555	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		100	0		100	0		0
Storage Lanes	0		0	1		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986				0.850			0.850			
Flt Protected		0.989		0.950							0.999	
Satd. Flow (prot)	0	1816	0	1752	0	1568	0	1759	1495	0	1808	0
Flt Permitted		0.989		0.797							0.716	
Satd. Flow (perm)	0	1816	0	1470	0	1568	0	1759	1495	0	1296	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				49			129			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		356			493			234			339	
Travel Time (s)		8.1			11.2			5.3			7.7	
Peak Hour Factor	0.60	0.60	0.60	0.96	0.96	0.96	0.89	0.89	0.89	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	8%	8%	8%	5%	5%	5%
Adj. Flow (vph)	17	50	8	271	0	52	0	1146	247	17	645	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	75	0	271	0	52	0	1146	247	0	662	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		-22			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	3	1		3		1		2	1	3	2	
Detector Template	Left			Left		Right			Right	Left		
Leading Detector (ft)	256	45		256		45		131	45	256	131	
Trailing Detector (ft)	-5	-5		-5		-5		-5	-5	-5	-5	
Detector 1 Position(ft)	-5	-5		-5		-5		-5	-5	-5	-5	
Detector 1 Size(ft)	50	50		50		50		50	50	50	50	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0		0.0		0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	125			125				125		125	125	
Detector 2 Size(ft)	6			6				6		6	6	
Detector 2 Type	Cl+Ex			Cl+Ex				Cl+Ex		Cl+Ex	Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0				0.0		0.0	0.0	
Detector 3 Position(ft)	250			250						250		
Detector 3 Size(ft)	6			6						6		

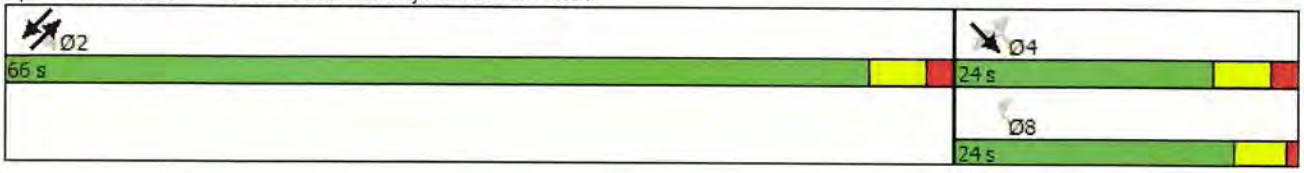
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector 3 Type	Cl+Ex			Cl+Ex						Cl+Ex		
Detector 3 Channel												
Detector 3 Extend (s)	0.0			0.0						0.0		
Turn Type	Perm	NA		D.Pm		Perm		NA	Perm	Perm	NA	
Protected Phases		4						2			2	
Permitted Phases	4			4		8			2	2		
Detector Phase	4	4		4		8		2	2	2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0		5.0		5.0	5.0	5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0		22.5		24.0	24.0	24.0	24.0	
Total Split (s)	24.0	24.0		24.0		24.0		66.0	66.0	66.0	66.0	
Total Split (%)	26.7%	26.7%		26.7%		26.7%		73.3%	73.3%	73.3%	73.3%	
Maximum Green (s)	18.0	18.0		18.0		19.5		60.0	60.0	60.0	60.0	
Yellow Time (s)	4.0	4.0		4.0		3.5		4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0		1.0		2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	0.0		0.0	
Total Lost Time (s)		6.0		6.0		4.5		6.0	6.0		6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0		3.0		3.0	3.0	3.0	3.0	
Recall Mode	None	None		None		None		Min	Min	Min	Min	
Walk Time (s)	7.0	7.0		7.0		7.0		7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0		11.0		11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0		0		0	0	0	0	
Act Effct Green (s)		17.9		17.9		19.4		60.1	60.1		60.1	
Actuated g/C Ratio		0.20		0.20		0.22		0.67	0.67		0.67	
v/c Ratio		0.20		0.93		0.14		0.98	0.24		0.76	
Control Delay		29.4		74.6		10.5		37.2	3.3		17.7	
Queue Delay		0.0		0.0		0.0		0.0	0.0		0.0	
Total Delay		29.4		74.6		10.5		37.2	3.3		17.7	
LOS		C		E		B		D	A		B	
Approach Delay		29.4			64.3			31.2			17.7	
Approach LOS		C			E			C			B	
Queue Length 50th (ft)		33		152		1		549	21		226	
Queue Length 95th (ft)		45		#300		30		#892	47		349	
Internal Link Dist (ft)		276			413			154			259	
Turn Bay Length (ft)						100			100			
Base Capacity (vph)		368		294		378		1174	1041		866	
Starvation Cap Reductn		0		0		0		0	0		0	
Spillback Cap Reductn		0		0		0		0	0		0	
Storage Cap Reductn		0		0		0		0	0		0	
Reduced v/c Ratio		0.20		0.92		0.14		0.98	0.24		0.76	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.98
Intersection Signal Delay: 31.9 Intersection LOS: C
Intersection Capacity Utilization 86.1% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: NH 102 & Fordway/Madden Hill Road



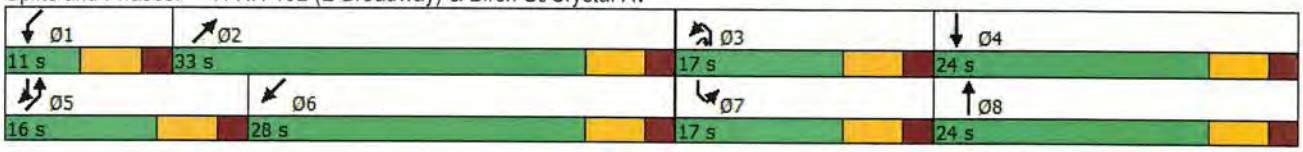
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	230	110	30	180	150	180	170	540	130	70	330	180
Future Volume (vph)	230	110	30	180	150	180	170	540	130	70	330	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	70		0	245		245	390		0	110		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.968				0.850			0.850		0.947	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	1786	0	1752	1845	1568	1787	1881	1599	1787	3385	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	1786	0	1752	1845	1568	1787	1881	1599	1787	3385	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15				150			137		116	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		361			411			477			530	
Travel Time (s)		8.2			9.3			10.8			12.0	
Peak Hour Factor	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95	0.94	0.94	0.94
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	253	121	33	194	161	194	179	568	137	74	351	191
Shared Lane Traffic (%)												
Lane Group Flow (vph)	253	154	0	194	161	194	179	568	137	74	542	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	3	8		7	4	5	5	2	3	1	6	
Permitted Phases						4			2			
Detector Phase	3	8		7	4	5	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	10.0	4.0	4.0	10.0	4.0	4.0	9.0	
Minimum Split (s)	17.0	24.0		11.0	24.0	16.0	16.0	24.0	17.0	11.0	24.0	
Total Split (s)	17.0	24.0		17.0	24.0	16.0	16.0	33.0	17.0	11.0	28.0	
Total Split (%)	20.0%	28.2%		20.0%	28.2%	18.8%	18.8%	38.8%	20.0%	12.9%	32.9%	
Maximum Green (s)	11.0	18.0		11.0	18.0	10.0	10.0	27.0	11.0	5.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	None	Max	None	None	None	
Act Effct Green (s)	10.0	12.0		10.8	12.8	28.7	9.9	27.3	43.4	5.1	19.7	
Actuated g/C Ratio	0.13	0.16		0.14	0.17	0.37	0.13	0.36	0.57	0.07	0.26	
v/c Ratio	0.57	0.53		0.79	0.53	0.28	0.78	0.85	0.14	0.63	0.57	
Control Delay	37.9	34.4		58.0	36.9	6.5	58.8	39.1	2.3	63.1	22.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	37.9	34.4		58.0	36.9	6.5	58.8	39.1	2.3	63.1	22.0	
LOS	D	C		E	D	A	E	D	A	E	C	
Approach Delay		36.6			33.6			37.4			26.9	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		D			C			D			C	
Queue Length 50th (ft)	60	64		94	75	14	87	261	0	37	91	
Queue Length 95th (ft)	103	120		#218	132	56	#206	#491	25	#108	152	
Internal Link Dist (ft)		281			331			397			450	
Turn Bay Length (ft)	70			245		245	390			110		
Base Capacity (vph)	492	435		253	437	684	235	669	984	117	1063	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.51	0.35		0.77	0.37	0.28	0.76	0.85	0.14	0.63	0.51	

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 76.7
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 33.8 Intersection LOS: C
Intersection Capacity Utilization 87.0% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: NH 102 (E Broadway) & Birch St/Crystal Av



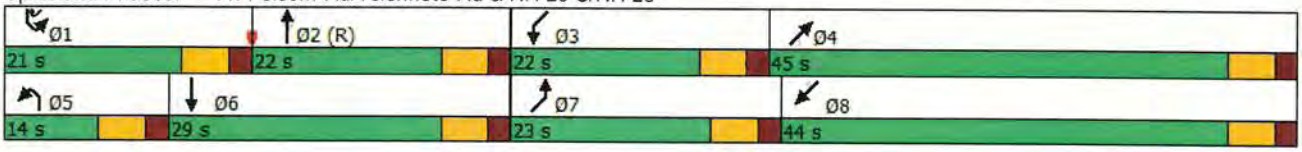
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	60	180	240	390	280	0	150	470	100	190	370	370
Future Volume (vph)	60	180	240	390	280	0	150	470	100	190	370	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		90	360		0	190		180	0		210
Storage Lanes	1		1	2		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	3433	3539	0	1770	1863	1583	1787	1881	1599
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	3433	3539	0	1770	1863	1583	1787	1881	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			261						208			240
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		639			495			532			387	
Travel Time (s)		14.5			11.3			12.1			8.8	
Peak Hour Factor	0.92	0.92	0.92	0.94	0.94	0.94	0.96	0.96	0.96	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	65	196	261	415	298	0	156	490	104	200	389	389
Shared Lane Traffic (%)												
Lane Group Flow (vph)	65	196	261	415	298	0	156	490	104	200	389	389
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6		7	4		3	8	1
Permitted Phases			2						4			8
Detector Phase	5	2	2	1	6		7	4	4	3	8	1
Switch Phase												
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	14.0	22.0	22.0	14.0	22.0		14.0	22.0	22.0	14.0	22.0	14.0
Total Split (s)	14.0	22.0	22.0	21.0	29.0		23.0	45.0	45.0	22.0	44.0	21.0
Total Split (%)	12.7%	20.0%	20.0%	19.1%	26.4%		20.9%	40.9%	40.9%	20.0%	40.0%	19.1%
Maximum Green (s)	8.0	16.0	16.0	15.0	23.0		17.0	39.0	39.0	16.0	38.0	15.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	None		None	None	None	None	None	None
Walk Time (s)		5.0	5.0		5.0			5.0	5.0		5.0	
Flash Dont Walk (s)		11.0	11.0		11.0			11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0			0	0		0	
Act Effct Green (s)	8.3	20.7	20.7	16.4	31.6		14.2	33.8	33.8	15.1	34.7	57.1
Actuated g/C Ratio	0.08	0.19	0.19	0.15	0.29		0.13	0.31	0.31	0.14	0.32	0.52
v/c Ratio	0.49	0.29	0.51	0.81	0.29		0.69	0.86	0.17	0.82	0.66	0.41
Control Delay	61.7	41.8	9.2	68.9	33.6		61.0	50.6	0.6	71.8	37.8	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	61.7	41.8	9.2	68.9	33.6		61.0	50.6	0.6	71.8	37.8	6.7
LOS	E	D	A	E	C		E	D	A	E	D	A
Approach Delay		28.0			54.2			45.8			32.4	
Approach LOS		C			D			D			C	
Queue Length 50th (ft)	44	66	0	148	85		106	319	0	138	232	49
Queue Length 95th (ft)	91	103	75	#245	104		173	428	0	#250	328	114
Internal Link Dist (ft)		559			415			452			307	
Turn Bay Length (ft)	110		90	360			190		180			210
Base Capacity (vph)	133	667	510	511	1015		273	660	695	259	649	945
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.29	0.51	0.81	0.29		0.57	0.74	0.15	0.77	0.60	0.41

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 40.3 Intersection LOS: D
Intersection Capacity Utilization 73.1% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Folsom Rd/Tsienneto Rd & NH 28 S/NH 28



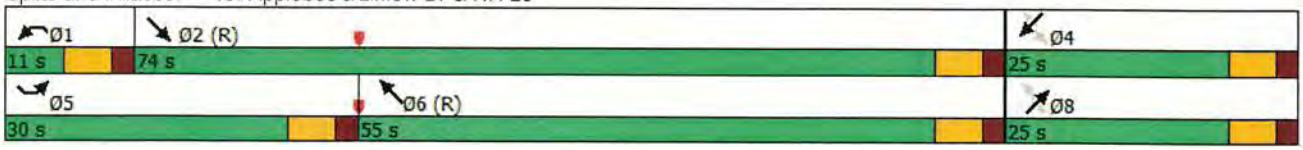
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	130	895	5	10	620	60	15	10	15	20	10	110
Future Volume (vph)	130	895	5	10	620	60	15	10	15	20	10	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	115		0	0		0	0		0
Storage Lanes	1		0	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.987				0.850			0.850
Flt Protected	0.950			0.950				0.971			0.968	
Satd. Flow (prot)	1787	3571	0	1787	3528	0	0	1845	1615	0	1821	1599
Flt Permitted	0.950			0.950				0.792			0.785	
Satd. Flow (perm)	1787	3571	0	1787	3528	0	0	1505	1615	0	1477	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			12				149			149
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		277			652			230			387	
Travel Time (s)		6.3			14.8			5.2			8.8	
Peak Hour Factor	0.97	0.97	0.97	0.95	0.95	0.95	0.90	0.90	0.90	0.80	0.80	0.80
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	134	923	5	11	653	63	17	11	17	25	13	138
Shared Lane Traffic (%)												
Lane Group Flow (vph)	134	928	0	11	716	0	0	28	17	0	38	138
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4	4	4
Detector Phase	5	2		1	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	26.0	63.0		11.0	48.0		21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	30.0	74.0		11.0	55.0		25.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	27.3%	67.3%		10.0%	50.0%		22.7%	22.7%	22.7%	22.7%	22.7%	22.7%
Maximum Green (s)	24.0	68.0		5.0	49.0		19.0	19.0	19.0	19.0	19.0	19.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None	None	None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0			11.0		8.0	8.0	8.0	8.0	8.0	8.0
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	0
Act Effct Green (s)	13.5	87.1		6.3	70.3			8.2	8.2		8.2	8.2
Actuated g/C Ratio	0.12	0.79		0.06	0.64			0.07	0.07		0.07	0.07
v/c Ratio	0.61	0.33		0.11	0.32			0.25	0.07		0.35	0.54
Control Delay	67.9	3.0		44.4	14.0			52.5	0.5		56.2	14.6
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	67.9	3.0		44.4	14.0			52.5	0.5		56.2	14.6
LOS	E	A		D	B			D	A		E	B
Approach Delay		11.2			14.4			32.8			23.6	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)	102	34		8	128			19	0		26	0
Queue Length 95th (ft)	157	84		m19	187			47	0		52	33
Internal Link Dist (ft)		197			572			150			307	
Turn Bay Length (ft)	100			115								
Base Capacity (vph)	389	2827		101	2257			259	402		255	399
Starvation Cap Reductn	0	0		0	0			0	0		0	0
Spillback Cap Reductn	0	0		0	0			0	0		0	0
Storage Cap Reductn	0	0		0	0			0	0		0	0
Reduced v/c Ratio	0.34	0.33		0.11	0.32			0.11	0.04		0.15	0.35

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 13.9 Intersection LOS: B
Intersection Capacity Utilization 52.4% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Applebee's/Linlew Dr & NH 28



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	770	5	5	580	190	40	10	10	350	10	140
Future Volume (vph)	80	770	5	5	580	190	40	10	10	350	10	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	280		150	205		150	0		0	325		150
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (ft)	150			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.999			0.963			0.925				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.955	
Satd. Flow (prot)	3467	3571	0	1770	3408	0	1805	1758	0	1715	1724	1615
Flt Permitted	0.950			0.950			0.950			0.950	0.955	
Satd. Flow (perm)	3467	3571	0	1770	3408	0	1805	1758	0	1715	1724	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			43			13				163
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		877			314			151			476	
Travel Time (s)		19.9			7.1			3.4			10.8	
Peak Hour Factor	0.84	0.84	0.84	0.90	0.90	0.90	0.78	0.78	0.78	0.86	0.86	0.86
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	95	917	6	6	644	211	51	13	13	407	12	163
Shared Lane Traffic (%)										49%		
Lane Group Flow (vph)	95	923	0	6	855	0	51	26	0	208	211	163
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases		2			6							
Detector Phase	5	2		1	6		3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		5.0	5.0		8.0	8.0	
Minimum Split (s)	11.0	22.0		11.0	22.0		22.0	22.0		22.0	22.0	
Total Split (s)	14.0	45.0		11.0	42.0		22.0	22.0		32.0	32.0	
Total Split (%)	12.7%	40.9%		10.0%	38.2%		20.0%	20.0%		29.1%	29.1%	
Maximum Green (s)	8.0	39.0		5.0	36.0		16.0	16.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	None		None	None		None	None	
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	8.4	63.6		6.0	51.8		8.5	8.5		19.6	19.6	34.0
Actuated g/C Ratio	0.08	0.58		0.05	0.47		0.08	0.08		0.18	0.18	0.31
v/c Ratio	0.36	0.45		0.06	0.53		0.37	0.18		0.68	0.69	0.27
Control Delay	51.6	17.3		59.6	21.0		54.8	32.2		52.7	53.0	4.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	51.6	17.3		59.6	21.0		54.8	32.2		52.7	53.0	4.6
LOS	D	B		E	C		D	C		D	D	A
Approach Delay		20.5			21.2			47.2			39.4	
Approach LOS		C			C			D			D	
Queue Length 50th (ft)	33	182		4	147		35	9		146	148	0
Queue Length 95th (ft)	55	332		m15	255		62	30		200	202	35
Internal Link Dist (ft)		797			234			71			396	
Turn Bay Length (ft)	280			205						325		150
Base Capacity (vph)	279	2064		96	1626		262	266		410	412	610
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.34	0.45		0.06	0.53		0.19	0.10		0.51	0.51	0.27

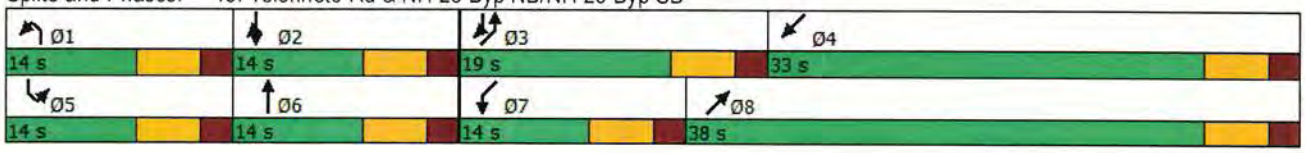
Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 25.9 Intersection LOS: C
Intersection Capacity Utilization 57.9% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: VIP Dr/Ashleigh Dr & NH 28

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	80	40	40	50	130	190	680	70	20	340	40
Future Volume (vph)	30	80	40	40	50	130	190	680	70	20	340	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	190		190	135		0	120		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.950				0.850		0.986			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1770	0	1787	1881	1599	1805	1873	0	1805	1870	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1770	0	1787	1881	1599	1805	1873	0	1805	1870	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25				137		8			8	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		481			347			479			371	
Travel Time (s)		10.9			7.9			10.9			8.4	
Peak Hour Factor	0.99	0.99	0.99	0.95	0.95	0.95	0.89	0.89	0.89	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	30	81	40	42	53	137	213	764	79	22	366	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	121	0	42	53	137	213	843	0	22	409	0
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	1	6		5	2	2 3	3	8		7	4	
Permitted Phases		6			2							
Detector Phase	1	6		5	2	2 3	3	8		7	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	14.0	14.0		14.0	14.0		14.0	28.0		14.0	14.0	
Total Split (s)	14.0	14.0		14.0	14.0		19.0	38.0		14.0	33.0	
Total Split (%)	17.5%	17.5%		17.5%	17.5%		23.8%	47.5%		17.5%	41.3%	
Maximum Green (s)	8.0	8.0		8.0	8.0		13.0	32.0		8.0	27.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	Max		None	None		None	None	
Walk Time (s)								7.0				
Flash Dont Walk (s)								15.0				
Pedestrian Calls (#/hr)								0				
Act Effct Green (s)	8.3	8.3		8.3	10.9	28.8	11.6	34.7		8.3	21.5	
Actuated g/C Ratio	0.12	0.12		0.12	0.16	0.43	0.17	0.51		0.12	0.32	
v/c Ratio	0.14	0.50		0.19	0.17	0.18	0.68	0.87		0.10	0.68	
Control Delay	33.7	35.1		34.2	31.2	4.6	42.0	31.7		33.4	27.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	33.7	35.1		34.2	31.2	4.6	42.0	31.7		33.4	27.5	
LOS	C	D		C	C	A	D	C		C	C	
Approach Delay		34.8			16.0			33.8			27.8	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	13	42		18	17	0	92	295		9	167	
Queue Length 95th (ft)	39	#113		50	59	36	#197	#700		32	263	
Internal Link Dist (ft)		401			267			399			291	
Turn Bay Length (ft)	200			190		190	135			120		
Base Capacity (vph)	218	240		219	303	800	361	966		222	782	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.14	0.50		0.19	0.17	0.17	0.59	0.87		0.10	0.52	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 67.5			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 30.3		Intersection LOS: C	
Intersection Capacity Utilization 70.6%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 18: Tsienneto Rd & NH 28 Byp NB/NH 28 Byp SB